OCTOBER
1941

Industrial FINISHING

Published Monthly in the Interest of Modern Precision Finishing

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Sanding plywood wings and stabilizers.

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USE RINCONTROL!

Equipment manufacturers who have long been familiar with Rincontrol's production advantages are continuing to use this improved wrinkle finish on defense work, especially where the job involves pre-finishing of later assembled parts.

Because every batch of Rincontrol is made to work the same, through scientific formulation and the addition of Rincontroller just prior to use, it greatly cuts rejections caused by non-uniform appearance, and speeds up production accordingly.

This easier to use textured enamel requires no primer for good adhesion on sheet steel, die castings and aluminum and is ideal for infra red baking. Write for booklet giving all the facts.

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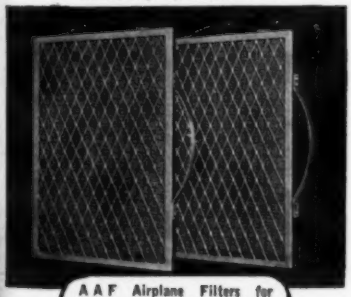
ELECTRO-MATIC and AMERICAN AUTOMATIC filter assembly lines

AMERICAN AIR FILTERS FOR NATIONAL DEFENSE

Roto-Clone Grinding Bench with Airmat PL after cleaner for finishing airplane propellors.



A A F Airplane Filters for cleaning intake air to engines.

Assembly lines such as those shown above crowded with Automatic and Electro-Matic filter sections for new industrial buildings, give some idea of the important part that air cleaning and dust control play in National Defense. In plants where tanks, planes, trucks, guns and shells—in fact wherever the countless defense materials are made—clean air plays a vital role in keeping production lines moving at unprecedented speed.

Men who operate machines must breathe freely of clean, wholesome air, and those machines must be protected from the ravages of abrasive dust and minute particles of metal, soot, oil vapors and fumes that break down the best of equipment or spoil machined surfaces.

American Air is proud of the part it is taking in the National Defense effort—AAF air filtration and dust control equipment delivered to manufacturing plants directly engaged in making war materials comprises approximately 80% of our output.

For more than 20 years AAF engineers have pioneered the development of equipment to eliminate dust. Bulletins describing the various types of AAF equipment are available on request. Please address 249 Central Avenue, Louisville, Ky.

THE SYMBOL AAF OF CLEAN AIR

AMERICAN AIR FILTER CO., INC., LOUISVILLE, KY.

DEFENSE PLUS CIVILIAN NEEDS— ZAPON'S OBLIGATION

Defense demand for many raw materials comes first. That's an obligation which we accept, of course, with no reservations. Like other manufacturers we are confronted with serious problems of supply. To offset these conditions insofar as is humanly possible, we are faced with the necessity of finding or developing other materials to replace those now unavailable. While we are trying to make these substitute coatings fit existing customers' finishing schedules as closely as possible—our customers in turn will—in many cases—have to alter their existing practice to get the most out of the new materials.

Zapon is keenly aware of its double obligation, first to defense needs and second to our customers' wants. Every facility at our command is being bent to honor this twofold obligation. Disregarding any temporary gains to be had from a seller's market, we are employing our technicians, our equipment and experience to fill the demand for finishes, using materials now available.

For the customer to reap the greatest good from our efforts to serve him, the closest cooperation between us is paramount. Only by working together with utmost frankness and respect for each other's problems, may we be able to find solutions to the critical conditions posed by the times. Customers can help us get needed materials for their requirements by advising us of priority extensions as promptly as possible.

ZAPON

ZAPON DIVISION · ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. *Western Sales:* North Chicago, Ill.

INDUSTRIAL FINISHES

Seventeenth Year of Publication

Industrial FINISHING

Reg. U. S. Pat. Office

Published Monthly in the Interest of Modern Production Finishing

Vol. XVII, No. 12 OCTOBER, 1941 $2.00 a Year

Contents of This Issue

Letters from Readers of Industrial Finishing 4
Furniture Finishing 12
Smoothing Surfaces with Portable Sanders 18
Foreman Solves Defense Speed-up Production 24
Painting Embossed Metal Plates in Two Colors 38
Tumble Finishing—II 50
New Materials, Supplies, Equipment 58
Questions; Answers 67
Editorial 76
"Classified Advertising" Section 83
Index to Advertisers 84

Safety Posters Free 9
High Speed Positive Cleaning 17
Basic Varnish & Research Expands 22
"Pedro Says" 37
Graph—U. S. Production of Synthetic Resins 56
Book About American Mahoganies 56
Catalog of Baking Ovens 56
A. G. Spencer Joins Rudd Lacquer Corp. 66
American Buff Co. Announces New England Representative 66
Maas & Waldstein Co.'s Exhibit at National Metal Exposition 69
Frolics in the Finishing Room—6 70
Flock Finishing 71
Pine Tree Finish 72
Machinery Finishes 74
Antique Finish on Furniture 82
Bulletin of Flow Meters 83
Chase Drier & Chemical Co. Moves to Cleveland 83

Owned and Published by
Practical Publications, Inc., 1142 North Meridian Street, Indianapolis, Ind.

Eastern Representative: C. A. Larson, 254 West 31st Street, New York City; Phone Penna. 6-9049

Letters from Readers...

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Polish Formula Wanted

Kindly let us know if you can send a practical formula to make a commercial polish to use in our factory to polish our furniture before it leaves the factory to be delivered to furniture stores.—Cia Mfra. De Muebles "La Malinche", S. A., Monterrey, N. L., Mexico.

Spring Clamps For Dipped Pieces

We dip a great many of our products and we are interested in securing a spring clamp that we can use on each handle and which can be used to hold it on the drying rack. Can you advise us the name of a manufacturer of this item?—S. Handle Co.

We have submitted names of a few manufacturers listed as making these products, but we are not sure of them. Can same reader give authentic information on this?—ED.

Plastic Edge Moulding

Stainless steel priorities have affected the metal used in the manufacture of our porcelain tops, and we have sought substitutes to replace these tops.

Linoleum and composition veneer on tops need a moulding at the edge of the table, and as aluminum and stainless steel are not obtainable, plastic moulds have been developed. Could you let us have the names of the manufacturers making this item?—H. S. Co. (in Canada).

Casket Finishing Materials

Referring to your article in the May issue of INDUSTRIAL FINISHING, entitled, "Preparing and Finishing Metal Caskets," by F. Hagan, you state that if desired, the names of finishing materials used will be given on request. May I trouble you for the names of these finishes?—C. C. Co.

Information supplied.—ED.

Tumble Finishing

Kindly send us literature on the process of tumble finishing small parts made of wood. We are going into the manufacturing of wood novelties and we would be interested to know how to finish same.—J. M. Co. (Mfrs. of Plastic Novelties).

See feature articles on this subject in this and last month's issues of INDUSTRIAL FINISHING Magazine.—ED.

I want to take this opportunity of thanking you for the information that you gave me about tumbling enamels. Through the names you provided I was able to secure what I was looking for.

I also have another problem. I

SURFACE—SERVICE

NOW THAT our products are known as "Protective Surface Coatings," we suggest new finishes which conserve—yet enhance the beauty of your finished surface, and prolong the life of your furniture.

Many new and unusual finishes for the coming markets are already in work in our Finish Studios.

By appointment, you may ship your new numbers to our Laboratories for complete finish in our latest color creations and unusual finishes.

Your finished samples will be delivered direct to your space at the Marts if desired. May we serve you?

V. J. DOLAN & COMPANY, INC.

Mnfrs. of "Unquestionable Quality" Industrial Finishes

1830 N. LARAMIE AVE. CHICAGO, ILLINOIS

know that it is possible to gilt wood and small objects by tumbling but I do not know how to mix the bronze powder for tumbling. I thought perhaps you might know how, or you might know the people who do. I would also like to know who handles this powder.—M. J.

We are submitting names of manufacturers of bronze powders and vehicles for same. These manufacturers will recommend the correct mixtures and give other information regarding the use of their respective materials. —ED.

I recall reading in INDUSTRIAL FINISHING magazine, items pertaining to tumbling methods of sanding and finishing small wooden objects. Would you send me whatever information you may have regarding this, or give me the names of concerns to whom I can write to get this information? I have in mind the ordinary type of wooden drawer pulls.—C. F. Corp.

Retouching Chrome

One of our members has written us asking if we can give him the name of a manufacturer of some material suitable for retouching chrome finish. He has had a number of complaints recently on chrome finish of breakfast chairs turning in color. He is under the impression that some firm in Chicago supplies such material.

Can you furnish the name of a manufacturer of a chrome refinisher? If so we would appreciate very much your writing our member direct and sending us a copy of the letter.—N. R. F.

Insulating Enamel

EDITOR INDUSTRIAL FINISHING. PLEASE CABLE NAMES OF MANUFACTURERS OF ENAMEL SUITABLE FOR MANUFACTURING ENAMEL INSULATED WIRE AS USED IN ARMATURE WINDING.—C. C., Johannesburg, South Africa.

What Does "Cellanize" Mean?

We have received an inquiry from a customer as follows:

"We have a round roller that our customer wants us to cellanize and we do not know what they mean. Will

Priority Orders . . .

UNITED'S DEFENDER LINE

Defense products often require specially formulated finishes to meet the exacting conditions of wear, tear and abuse which they will receive in actual use. United's chemists have developed the DEFENDER LINE of production finishes to meet the extraordinary specifications and requirements of defense products. If you have a production finishing problem on priority rated products you will find a quick solution among UNITED'S DEFENDER Line of production finishes.

Your request for working samples and complete information will receive prompt attention.

LACQUERS
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UNITED LACQUER MFG. CORP.
General Offices and Factory: Linden, New Jersey
New England Mfg. Division: Boston, Mass.

you please send us what information you can on this, and if it is just another word for a filler."

What does the term "cellanize" mean? We do not seem to have anyone here who has heard about a process under this name.—J. Z. Co.

We don't know either. Will some reader who does know please write and give us this information?—ED.

Paint for Glass

Through the courtesy of the Universal Shellac Co. of our city, your name was given to us for some information regarding what kind of paint we can use to paint on ⅜-in. and 1¼-in. glass rods without baking same on —something that will not peel or wash off.—R. Novelty Co.

Hammered Effect Finish for Caskets

We are interested in a hammered-effect finish for metal caskets in metallic colors, such as bronze, gunmetal, silver, etc. Since we have no ovens, it must necessarily be a lacquer finish or a quick-drying synthetic. I would like very much to know what manufacturers can supply this material, preferably for use on bare metal, since it is to be used on our lower priced lines.

Also, about the spray guns; must we get a special outfit or can we get an attachment for our regular guns? —X. Co.

Rubbing Machines

Kindly advise us who are the manufacturers of the Sundstrand Rubbing Machine; also the names of any other manufacturers of rubbing machines that are on the market.—E. Corp. (Radio and Television Apparatus).

In your magazine we notice an illustration of a rubbing machine. Sundstrand Machine Tool Co. is given as the manufacturer's name, but no address appears. Would you kindly give us the address? Likewise, the address of Paasche Airbrush Co.? These are legitimate inquiries as we may be interested in a rubbing machine.—Y. Cabinet Co.

Information supplied.—ED.

Wood Filler

In your September issue, you have an article by F. R. Boynton, on page 52, telling about a superior filler. We would appreciate it very much if you would put us in touch with this manufacturer.—H. B. Co. (Commercial Seating Furniture).

In your September issue you had an article entitled "Lacquer and Synthetic Finishes for Wood Furniture and Fixtures" by F. R. Boynton. Would you be kind enough to tell us whose filler this article referred to.—I. C. Co. (Radio Cabinets).

Information supplied.—Ed.

Pipe Insulation

Could you please give us the name of the people that make the "Insulmat" to prevent condensation on pipes, as per your article in the INDUSTRIAL FINISHING of September, page 62?—B. Furn. Co. (Fine Period Reproductions).

It's J. W. Mortell Co., Kankakee, Ill.—Ed.

Replacing Exhausted Air From Spray Booths

I have just read your editorial in Sept. 1941 issue, page 77, covering "Replacing the Air Exhausted from Spray Booths."

We have been installing equipment such as this for several years and have numerous installations in metal-working plants, both for enamel and lacquer finishing in the porcelain enamel industry, and have recently made several large installations in airplane manufacturing plants.

The usual procedure is to enclose the spray booth or spray booths in a room and supply sufficient air into this enclosure to offset the amount of air exhausted from the room by the spray booths, and add an additional amount of air to create a slight pressure in the enclosure so that there is a definite movement of air from the room into the factory proper through the conveyor opening, and also to prevent any air from coming from the factory when the doors are opened. In this way, all of the air in the enclosed space is absolutely controlled, both as to temperature and being free from dust.

These systems are ordinarily run through the entire year. The intake stacks are extended about 15 to 20-ft. above the roof line to get them away from the heat from the roof in the

CHRISTMAS

Is Not Far Off . . .

NOW IS THE TIME

to create beautiful holiday items by decorating with a coat of

LUSTROUS RAYON FLOCKS

—in bright Christmas red or green shades. Spray gun or screen process application of rayon flocks gives new life and eye appeal to otherwise flat or dull appearing products, resulting in larger sales and larger profits.

DRESS UP

your holiday novelties to keep in step with hundreds of your competitors who are doing it not only on holiday items but all year round.

CLAREMONT WASTE MFG. CO.

CLAREMONT, N. H.

The country's leading makers Cotton, Wool and Rayon Flocks

SEA-LAC

DEFENSE ORDERS SAIL THROUGH ON TIME

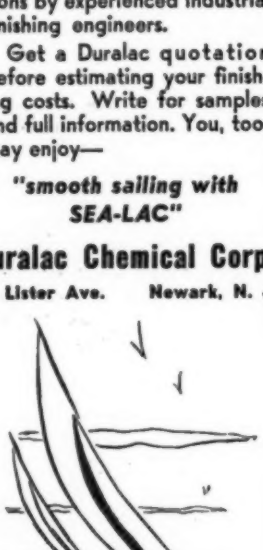
. . . when finished with SEA-LAC Lacquer Enamels and Baking Synthetics manufactured to exacting specifications by experienced industrial finishing engineers.

Get a Duralac quotation before estimating your finishing costs. Write for samples and full information. You, too, may enjoy—

"smooth sailing with SEA-LAC"

Duralac Chemical Corp.

84 Lister Ave. Newark, N. J.



summer. In this way much more comfortable working conditions are maintained during the summer than can be had if air is exhausted from the plant proper. Also, the air is filtered during the summer as well as the winter months.

These systems are installed with heat units to operate from low or high pressure steam, gas or electricity, depending on the cheapest type of heat available.

At the present time we are figuring with two furniture plants for installations of this type and we would appreciate receiving any inquiries that you have or the names of any plants you know of who are considering installations of this type.—F. L. Elliott, Chief Engineer, George Koch Sons, Inc.

Crystallizing Finish; Air-Dry Wrinkle

Will you please give us the name of a source from whom we may obtain an air-drying wrinkle, crackle, and crystallizing lacquer or varnish or enamel? We would like for this material to be a clear, so that we could mix it in the various tints that we desire. However, if it doesn't come that way we will have to use what we can get.

We have tried one or two different brands of supposedly air-drying crystallizing enamel with no success. We will appreciate your sending us whatever information that you might have available on these products.—B. F. Co.

Substitutes Wanted

Due to the impossibility of obtaining any aluminum paste or gold paste, could you advise us if there is any substitute for the above, and where to obtain it?—U. U. Corp. (Musical Instruments).

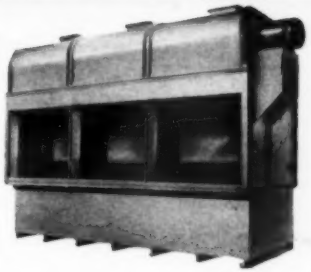
Coating Makes Glass Shatterproof

We understand there is a synthetic material on the market called "Garinol." This material can be sprayed or brushed onto glass and it is transparent. It air dries and will prevent glass from shattering after it is fractured. We would appreciate your advising us if you have any information concerning this product.—N. A. of P. A.

Our guess is that you have in mind "Gardinol," a product of the Du Pont Co's. Fine Chemical Division at Wilmington, Dela.—ED.

ONE of the specialized designs of Spray Booths using the INDUSTRIAL HYDRO-WHIRL

Here it is used for spray painting magnesium alloy castings in a large motor car plant. The Hydro-Whirl was chosen because it affects a sure and economical means for removing pigments from paint-laden air.



No paint can pass through the constant "water whirl" action—all "air holes" are stopped the full length of the booth. Maintenance reduced because no eliminators to clean.

Investigate the many adaptations of Hydro-Whirl; discuss your paint spray problems with our engineers.

INDUSTRIAL SHEET METAL WORKS

Manufacturers of Hydro-Whirl Spray Booths and Dust Collectors, Industrial Ovens and Ventilation Systems

626 E. FOREST AVENUE • DETROIT, MICH.

Which Bennett Is Author

We are interested in the Standard Chemical & Technical Dictionary by H. Bennett, as advertised on page 83 of July 1941 INDUSTRIAL FINISHING. We should like to know if the author is Mr. Harold Bennett of Bloomfield Chemical Co.—A. F. & H. Co. (True Temper Products).

The Standard Chemical & Technical Dictionary was edited by Mr. Harry Bennett, President of the Glyco Products Co.—ED.

Substitute for Aluminum Finish

In your June and July issues, concerning an article about substitutes for aluminum finishes, would you be kind enough to advise us the names of companies furnishing such substitutes?—A. B. Corp.

Elimination of corona (discharge of electricity . . .) in the air spaces between various coils of the end winding of rotary machines has been accomplished by treating the end-turn insulation with Coronox, a new semiconducting paint.—Westinghouse.

Safety Posters Free

American Optical Co., of Southbridge, Mass., announces it will be glad to place any industrial firm on its mailing list for a free safety poster service inaugurated several years ago. At certain intervals during the year dramatic, colorful safety posters, driving home to workers the value of safety precautions, are made up and mailed to concerns desiring the service.

The optical company emphasizes that in these days of defense programs, overtime wages and production schedules, the value of a consistent, well-planned safety program cannot be overestimated. For example, according to recent statistics, the first two months of 1941 in comparison with the same period of time in 1940 saw a manufacturing employment increase of 9% while occupational accidents jumped 7%. Such an accident record cannot fail to reduce production and increase production costs.

To combat this trend, American Optical Company suggests compulsory wearing of safety equipment on hazardous jobs and the distribution of educational material such as safety posters to remind workers, for example, that the exchange of their own precious eyes for glass eyes is the height of a poor bargain.

OF COURSE FINISHES BEAUTIFY, BUT.....

"Finishing Materials" used by the fair sex have no other qualities except to beautify or enhance appearance. **Organic finishing materials** used on metal, wood or other compositions do a specific job of PROTECTING, as well as beautifying. They may not ward off bullets but they do ward off the attacking elements of rust and corrosion on metal, moisture and warping of wood and numerous other elements of destruction. LILLY'S finishes are especially suited

THE LILLY COMPANY
HIGH POINT, N. C.

MORE IMPORTANT..... THEY PROTECT!

for PROTECTING because they are specifically formulated. More than ten years ago we adopted the slogan "With The Right Finish, You'll Finish Right" and since that time our full efforts have been devoted to making **specific** finishes for **specific** products and **purposes.** Since **protection** should be the paramount purpose of a finishing material at this time we are therefore well prepared and qualified to produce finishes for the specific purpose of protecting.

LILLY VARNISH COMPANY

INDIANAPOLIS, IND.

Great Britain and Europe: Apply Jensen & Nicholson Laboratories, Stratford, London, England

Furniture Finishing . . .

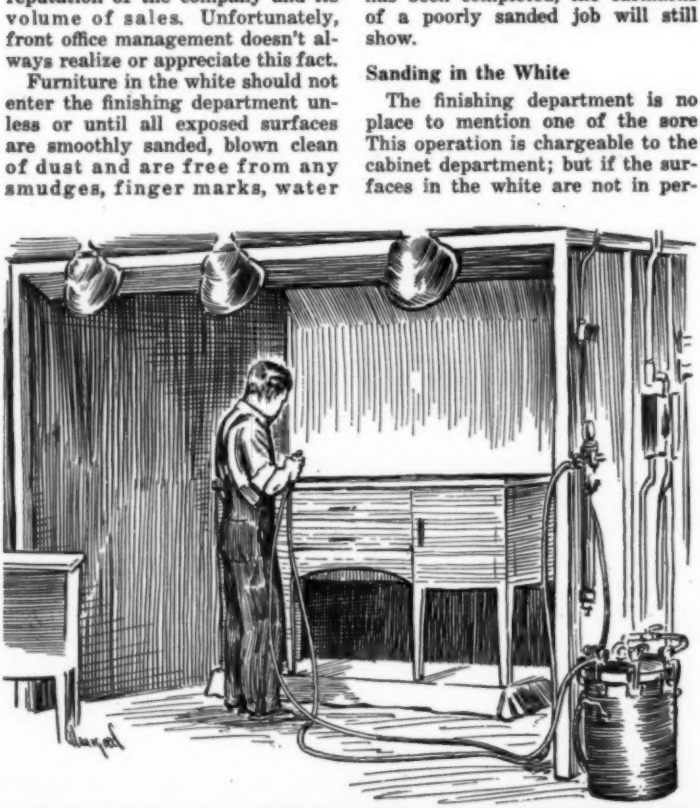
BY F. W. WORTH

THE condition of furniture in the white is what every practical finisher considers first. This is a point of real importance to all wood finishers — and later it becomes a dominant feature in the reputation of the company and its volume of sales. Unfortunately, front office management doesn't always realize or appreciate this fact.

Furniture in the white should not enter the finishing department unless or until all exposed surfaces are smoothly sanded, blown clean of dust and are free from any smudges, finger marks, water marks, discolorations, dents, etc. If the sanding and clean-up work are not well taken care of, the result will be detrimental to the piece of furniture all along the line of finishing. Even after the finishing has been completed, the earmarks of a poorly sanded job will still show.

Sanding in the White

The finishing department is no place to mention one of the sore This operation is chargeable to the cabinet department; but if the surfaces in the white are not in per-



fect condition before finishing begins they are not going to become so through any process of regular finishing.

To make sure that furniture in the white is in perfect condition to enter the finishing room, I suggest that a competent inspector be stationed in the cabinet room. Then let nothing be allowed to leave the cabinet department without his okay.

Right at this point is a good place to mention one of the sore spots that has existed between cabinet and finishing departments for as many years as I can remember. You have heard of the old game of "passing the buck" on to the other fellow. Well, here is where you find it in its worst form, particularly if the superintendent or manager of the plant happens to be more interested in machine and cabinet work.

Some executives assume that when the work is completed in the machine and cabinet departments and delivered to finishing room, the job is practically through insofar as any skill in workmanship is concerned. This attitude has prevailed and it is still in evidence in many factories throughout the country. Naturally there is sometimes a bit of ill feeling between the departments due to this one point.

Staining; Old and New Materials

Next, the furniture is delivered to the stain booth where the desired color base is applied. The one who puts on the stain must be a capable individual, able to recognize the various kinds of wood while spraying. Some portions of the surface will be dark wood; others will be light in color. Some surfaces will be solid; others will be veneered. An experienced and skillful stainer will keep this point in mind and "carry the color in his eye" to the extent that when he has completed the piece it will be uniform in color insofar as he can make it that way.

This is where the new types of stains—such as uniforming stains, shading stains and non-grain-raising stains — show a marked improvement over the old water stains and oil stains. These new stains will stand exposure to light without fading. Of course, any stain changes to a certain degree with age, but the point I want to bring out is that if the proper stain is used it will not fade, as some stains I have seen. I have finished furniture which, after it had been in the stock room for a while, showed a dirty faded, worn out, washed out color.

Now, without any sanding of the stained surfaces, the pieces of furniture are delivered to the filling department and can be filled within 30 minutes to one hour (depending upon humidity, etc.) after staining.

▼ ▼ ▼

Practical man with extensive experience in modern cabinet and furniture finishing gives several valuable suggestions and recommendations on many phases of this work, placing particular emphasis on sanding in the white, staining, filling, shading to uniform color, sealing and sanding between coats. He exhibits a cost analysis to compare new and old type stains for furniture finishing.

If a water stain were used it would be necessary to washcoat and sand the surfaces before delivering the furniture to the filling department. Naturally, this would call for additional labor, time, materials and supplies.

Comparative Cost Analysis as Applied to Staining

Right here is a good time to figure comparative costs of production involved in using the two different stains. A water stain formula, made up by using stain powder (say 5-oz. of powder to one gallon of water) would cost 25 cents per gallon (figuring the stain powder at 80 cents per pound).

Suppose that the preparation of the stain requires 20 minutes. If the workman receives 60 cents an hour, it will cost the company 20 cents for the mixing. Then the washcoat must be figured in. With shellac selling at $1.50 a gallon, and cut with alcohol in the proportion of four parts of alcohol to one part of shellac, the washcoat will cost 78 cents a gallon mixed. This is figuring alcohol at 60 cents per gallon.

For sanding, figure No. 6/0 finishing paper at 6 cents per sheet; operator's time, 40 cents per hour.

Now with these figures at hand we will apply them to a typical buffet to arrive at the comparative costs. (See itemized list of costs in the next column.)

This shows how typical figures compare as to labor and material. However, the saving in time and floor space is to be considered, plus the speeded-up production which, of course, favors the modern way of staining, using the new type stains.

This is one item that some manufacturers will not even investigate carefully. They refuse to go into the cost figures because the original cost of the newer types of stains seems to be high. If the manager would just let the finishing salesman or service man demonstrate what can be done for him, he would soon see the light.

Cost of using water stain (plus washcoat, plus sanding)

Water stain, 1 pint used	.03
Labor*, spraying stain	.08
Shellac washcoat**, 1 pint	.10
Labor*, spraying washcoat	.08
Sandpaper (¼ sheet)	.01
Labor, sanding†	.03
Total	.33

*Spray operator's time, day work or piece work, 8 minutes or 8 cents.
**Mixing of washcoat included.
†Allowing 5 minutes at 40c per hour.

Cost of non-grain raising stain (No washcoat; no sanding)

N. G. R. stain, 1 pint at $1.25 per gal.	.15½
Labor, spraying stain	.08
Total	.23½

Another Factor in Our Appraisal of Stains

Here is another factor to figure when buying stain of this type: You get the proper color, etc., all correctly formulated for you when you buy the material. As a result you are sure to get the same color everytime. No variations in colors occur from one shipment to the other—if you are buying from a reliable company. It takes this responsibility off the foreman finisher's shoulders and makes the material manufacturer accountable for the product. If a reliable source of supply has been decided upon, it is a matter of satisfaction to know that pieces that have to be made up to fill in with a suite which was formerly made and shipped—these new pieces can be finished easily

and quickly, and you know that they are coming out in a color to match the original run.

Filling—The Foundation of A Satisfactory Finish

Proceeding with the delivery of the stained furniture to the filling department*, this is one place where all the skill and care of fine workmanship are required in order to see that the surfaces are properly filled. This is very important but some concerns do not realize it. For instance, I would compare the importance of such an operation to the foundation of a house. If the foundation is not right, you will not have a well constructed house when the job is completed. The same thing applies to filling. If the job is done haphazardly, this fault can not be removed later, regardless of the quantity or quality of finishing material put on.

I would consider having only high-grade experienced men in the filling department — and I would give this department close supervision. I would not have the filling department on a piece-work schedule, as I believe this would probably mean murder to the finish. The proper benches and tools are also important.

Immediately after the filler has been applied there is a time when it is just right for the surplus to be wiped off and there are certain materials and a special technique required for properly wiping off excess filler. Filler can be easily pulled out of the pores of the wood if the wiping-off isn't done just so. Be sure to allow plenty of time for the filler to dry thoroughly before any other operation is started.

*On high grade work, some finishers recommend a washcoat of sealer over the stain —before the filler is applied. However, this practice may be open to argument. There is probably no universal agreement on it.

The ever present fire hazard in the filling department is a factor that must be considered at all times. Filler is generally made up of considerable linseed oil, and it has to be cut with naphtha or some similar product which is highly inflammable. If strict rules are not enforced, some workmen may leave portions of oily rags or tow on the floor when they quit work at noon and in the evening. Perhaps it is a hot summer day. These oily rags, if packed closely together, may catch afire from spontaneous combustion. A good plan is to provide one or more metal waste containers, each with a self-closing cover. Then enforce a strict rule to the effect that workmen must throw used oily rags into this safety container. Each day's accumulation of oily waste or rags should be destroyed —or cleaned if economical facilities for cleaning are available at the plant or elsewhere.

As for the use of quick-drying fillers, this is a matter of personal choice and opinion among different finishers and their bosses. Good quick-drying fillers are manufactured and can be used to advantage, especially where a lacquer finish is used—and where the company insists upon faster production and is obliged to get along with limited floor space.

The output from the filling department is moved into the first-coating department — after it has been allowed plenty of time to dry thoroughly.

Use of Shading Stain to Uniform the Color

There are differences of opinion about how to proceed with the first coating operation. Some finishers like to uniform the color first by using lacquer shading stain. This is good practice, as it gives you a uni-

form color under all the coats. However, the use of shading stain is overdone in some factories. It can be applied too heavy in color, thereby making the surface look smoky. The natural color of the wood is covered up and you lose depth of color in the finish. This is one bad feature about the use of a lacquer shading stain. The shading stain is made to be used as a tone-up stain—not as you would use a solid color, spoiling all the good that has been done in the previous operations. Really, the correct use of shading stain calls for an expert workman who has a good eye for color.

In some furniture and cabinet factories it is customary to use shading stain skillfully but sparingly over a light sealer coat, after the sealer coat is sanded. Then the man who sprays the shading stain can clearly see what he is doing. If any edges or corners have been sanded through, he can touch them up—and there will be no sanding of the touched up surface to undo anything he has accomplished. Some experts declare that a much clearer and higher grade job of finishing will be the result.

Spraying the Sealer Coat; An Essential Operation

Now the furniture is in line to receive the sealer coat. The spray operator here will have his hands full, as he must apply a coat of uniform thickness on all surfaces. He has to see to it that the pieces are fully covered. Much depends upon the result of this operation. For instance, if an even coat has not been put on with the proper air pressure for spraying, and if the filler coat was not properly thinned to allow it to flow smoothly (and then properly wiped and dried) the coated surface may show an "orange peel" effect which is a difficult surface to sand down smoothly.

Another thing that can be emphasized on this operation is the need for cleanliness in the spray booth and in the surrounding room. If the spray operator is weighted down with waste material on his clothes and shoes, you can look for careless work from him. I have had men working on the job who, when they changed clothes to leave the factory, slipped off a pair of pants that were stiff enough to stand alone. This is not the kind of men to have on the job. A man who has two pairs of overalls, or even three pairs, so he can wear one pair while the other pair is being laundered, is the type of sprayer who is in demand. His work will be superior to that of the sloppy careless individual.

Cleanliness in the Entire Department is Essential

The floor of the spray room should be kept clean and in good condition. It should be smooth but not slippery. I suggest treating it with a mixture of light paraffin oil and naphtha, wiping the floor first to get all the dust and dirt out of the cracks. The floor should be oil-treated at least once a month—and swept every day in order to keep down all dust. It is surprising to see improved results on the work—no dust particles flying in the air to settle on the finished furniture. When fine particles of dust are allowed to settle on the finished wet-coated surfaces they stick to the finish and have to be sanded out before the surface can be coated again.

The spray booth walls and floor should be cleaned every night. It is in the interest of safety to remove waste material from the factory

promptly. Lacquer waste, in particular, is something that does not belong in the factory over night. The danger of fire is always present at spray booths, but this hazard can be reduced to a minimum by keeping the booths clean. A fire or an explosion can mean a great financial loss to the company and it may result in injury or death to one or more employes.

An extra spray gun should be on hand at all times, properly serviced and ready for use. The sprayer who has to work with a faulty or obsolete spray gun loses confidence in himself and his employer. He acquires a "don't give a darn" attitude due to this one thing. For maximum efficiency I believe in providing the workmen with the best tools and equipment that can be obtained. They like to use first class equipment and they will turn out more and better work with it.

Sanding Sealer Coat; Close Supervision Needed

Sanding the sealer coat comes next. This light sanding between coats can be done by girls and women; or by boys and old men who are not able to do other work. However, the work requires good eyesight, intelligence, skill and some degree of speed on the part of the workers. There should be reasonably close supervision, of course, to prevent the possibility of insufficient, excessive or improper sanding. One operator in this room should be the inspector of all work done, because when it leaves this station it will have a perfectly smooth surface — that is, then or never. Following this sanding, the surfaces should be cleaned of all loose dust. If any edges or other places are damaged, these should be expertly repaired before the furniture goes to the next spray booth.

Final Coat; Rubbing; Polishing

Entering the final coating department, we should find a room that is clean, well lighted, and adequately ventilated. It is important that overhead pipes be free from dust; likewise the windows, walls, racks and spray booths. The last coating should be applied by a well-trained spray man who is careful to look over all surfaces before he begins to apply the final finish. Naturally this final coat must be sprayed on uniformly, using material and air pressure that are best suited to the job.

After the furniture stands overnight the department is emptied in order to make way for the next day's production. Perhaps part of it will be transferred to the stock room to await specific orders before being delivered to the rubbing department in preparation for shipment to customers.

The furniture is carefully rubbed to a satisfactory sheen. Then it is waxed and finally the trimmings, including hardware, are put on. Each completed piece of furniture is given a final inspection before being packed or crated. The most critical inspection is given here, as this is the last time the furniture is seen before being delivered to a customer.

High Speed Positive Cleaning

In an 8-page, 8½ x 11-in. illustrated bulletin published by the Hypressure Jenny Division of Homestead Valve Mfg. Co., Coraopolis, Penna., we read:

"Hypressure jenny steam cleaning is the fastest and most thorough cleaning method known because it combines, in a steam vapor spray, the right amounts of steam, highly atomized hot water, pressure and cleaning compound to do a 100% cleaning job. This powerful cleaning spray dissolves, cuts and flushes grease and dirt from surfaces almost instantly."

Illustrations show several portable models in service on various types of industrial cleaning jobs.

Smoothing Surfaces with Po

BY FRANCIS E. WESTBROOK

Photographs by Courtesy of Detroit Surfacing Machine Company

WHEN it comes to increasing output, saving labor and reducing production costs, in connection with the Defense Program, surface-smoothing and finishing operations are just as important as any other step in the manufacturing process. Among recent advances along these lines, the employment of portable reciprocating sanders is saving from 50% to 80% in many surface-smoothing operations. This is another way of announcing that the productivity of the workers is increased correspondingly, not to mention the saving in costs.

In order to show convincingly what can be done in this direction, the experiences of a few specific users of this type of equipment are revealed in the following paragraphs. In order to cover the possibilities as widely as practicable, a few users among manufacturers of civilian goods are cited too, because their experiences are suggestive of what can be done in different lines of modern production work.

The Aviation Division of the Briggs Mfg. Co. uses these portable reciprocating sanders for preparing or cleaning alclad surfaces of airplane wings, stabilizers, elevators, etc., before welding.

The metal wing coverings termed "skins" replace cloth and are spot-welded to stiffeners. It is necessary to thoroughly clean the alclad before welding. On the wings, strips about 3¾-in. wide, along the full length of the wing, must be cleaned. The reciprocating sander, equipped with a standard pad, has proven highly satisfactory for this work.

For welding the fins and other smaller parts the alclad strips, which must be cleaned, are narrower—only 1⅛-in. wide. For this application, a special sponge-rubber sanding paid is used instead of the regular pad.

The abrasive grit used for cleaning the alclad coating is No. 240 open-coat aluminum-oxide abrasive. Twice over the surface with the machine, using medium pressure, does the work. By this method

Portable Sanders

On a great many kinds of products a surface-smoothing operation (usually sanding with abrasive paper) is needed to prepare the way for the application of protective or decorative coatings, such as paint, varnish or lacquer. Also, a light sanding is often necessary between coats of paint. This article tells how portable sanders are used in several factories for smoothing various surfaces before finishing.

about 60% is saved in time and abrasive material, and the uniform cleaning and surface resulting from this method helps produce a better weld.

Obviously to carry on such operations mechanically represents a great saving in comparison to doing it manually. In this connection it is to be noted that the element of fatigue, due to manual work, is greatly reduced. This means a better quality of work as well as more production.

Smoothing Surfaces of Propellers

Another interesting example of the adaptability of this equipment in the aviation industry is found in a factory that makes duralumin propellers. These metal propellers are gone over with the reciprocating sander to remove scratches following a belt-sanding operation. For this purpose a slightly coarser sandpaper is used on the reciprocating machine than on the last belt-sanding operation. For instance, if the last belt-sanding was done with No. 150 grit, the finish sanding with the reciprocating machine should be performed with No. 120 grit. The sanding may be done either wet or dry. If the surfaces are wet sanded, a light oil and kerosene mixture is recommended as a lubricant.

At one of the large airports these portable sanders are used for propeller maintenance—mainly for the removal of pits which develop in the propellers during service. For this work a coarse abrasive paper of No. 50, 60 or 80 aluminum-oxide is used for the first cut.

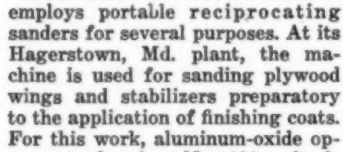
Since the pits are small, only the corner of the sanding pad is used. It is pressed against the surface and rotated slowly. Finer grits are used for producing the final finish. For general clean-up work, No. 120

to No. 180 grit is recommended, and for the final finish, No. 220 to No. 320 aluminum-oxide open-coat, sanded dry.

Another airplane manufacturer uses this machine for removing scratches and discolorations from dural metal before anodizing. For this application, No. 360 cloth-back aluminum-oxide abrasive is used with crude-oil lubricant.

Sanding Aircraft Parts

The Fairchild Aircraft Division employs portable reciprocating sanders for several purposes. At its Hagerstown, Md. plant, the machine is used for sanding plywood wings and stabilizers preparatory to the application of finishing coats. For this work, aluminum-oxide open-coat abrasive, No. 100 grit, is used for the first cut. The final smoothing is with No. 180 grit.



Sanding plastic forms at Seeburg plant.

At the Fairchild plant in Jamaica, N. Y., the same type of equipment is used for smoothing the surfaces of aerial cameras preparatory to the application of a grained finish. The aluminum die-castings are discolored by heat as they come from the presses. This discoloration must be removed without turning the edges of the soft aluminum. This is accomplished by first making a cut with No. 80 grit and then finishing with No. 120 grit abrasive. The result is an excellent surface, with substantial savings in time and abrasives.

In the fabrication of plywood airplanes, trailers, boats, and similar products—due to the many convex surfaces encountered—the reciprocating sander has proved practically indispensable. Abrasives used on the various surfaces vary, depending upon the application and finish desired. As a general rule, with these reciprocating sanders, from one to two grades coarser grit is used than on the same application by hand.

Smooths Plastic Materials, Too

A few examples taken from other industries will indicate the versatility of this equipment. The J. P. Seeburg Corp. of Chicago, Ill., manufacturer of automatic musical instruments, uses numerous parts made of plastic materials which must be polished. They are in the form of sheets of various shapes and are received in an unfinished condition. These surfaces must be polished before fabrication.

First the sheets of plastic are placed on wooden jigs and sanded by large stationary belt sanders. Workmen use blocks of various forms to fit the surfaces and to serve as pressure pads. The belt sanders remove the large ripples and major defects. Then, while the plastic sheets are still held in the jigs, the portable sander is used to sand the surfaces with No. 220 aluminum-oxide open-coat abrasive pa-

per, to remove scratches. In this case it is not necessary to use blocks of different forms for pressure pads because this type of sander is such that it is capable of going over the contours satisfactorily. Finally, the plastic surfaces are buffed with a high-speed polishing wheel.

The point of particular interest in the foregoing example is the fact that the portable reciprocating machines can be used to remove scratches from irregular surfaces without difficulty, thereby saving time as well as abrasive.

Smooths Composition Wall Tile; Feather-edges Damaged Places

The manufacturers of composition wall tile have an interesting application. These companies make tile wallboard which is put through a machine that scores or cuts multiple grooves to divide the board into small squares so it resembles tile. The board is then sprayed with a primer coat and two coats of finishing material. The last coat is sanded with the portable sander to remove the orange-peel effects. The enameled surfaces are wet sanded, using No. 280 or No. 320 waterproof abrasive paper with water.

Many companies have occasion to touch up or repair finishes on products that have been damaged during shipment. This is especially the case with home appliances, such as ranges, refrigerators and washing machines. Whenever this involves any cutting away and feather-edging of the surrounding finish, the portable sander can be used effectively. For feather-edging scratches and other damaged spots, No. 100 or No. 240 aluminum-oxide open-coat abrasive paper is generally used dry. If the occasion calls for it, these repairs can be made in the customer's home or store.

For feather-edging and sanding soldered areas, the surplus is first removed with a rasp or portable grinder. Then follows the portable reciprocating sander, using No. 80 aluminum-oxide open-coat abrasive

Sanding the surfaces of steel railroad cars.

paper and sanding dry. The result is an approximate saving of 60% in time and abrasive, plus a much finer job.

A final example is the experience of the Federal Telegraph Co., Newark, N. J., which now secures an excellent surface on aluminum panels at a saving of from 65% to 75% in the time and labor formerly expended. In this instance a grained finish is the objective. The surfaces are smoothed by first using No. 180 grit aluminum-oxide open-coat paper for the first cutting. This removes all scratches. This first cutting is followed by finishing with No. 320 grit waterproof abrasive paper and machine oil.

The reciprocating action of this

type sanding machine mechanically duplicates the natural back-and-forth motion of hand work. It takes over where the disc or belt-type machine leaves off, doing the numerous finishing jobs that must be done with a straight back-and-forth action such as rubbing polish, finish sanding, feather-edging, metal finishing, and scuffing. They are also successfully used for compound rubbing or waxing on wet or dry applications, using oil, water, or soap solutions as lubricants.

While the action is the same as hand work, these machines average approximately 3000 complete strokes per minute. As a comparison, the average hand operator works at a speed of about 150 strokes per minute. Then too, sanding machines are not subject to fatigue periods. Being light in weight, they are easy to operate and are welcomed by workmen.

A 2-pad air-driven machine in service.

Editor's Note: In addition to the electrically-driven reciprocating-block sander illustrated in the foregoing article, there are two different makes of portable reciprocating-block machines which are driven by compressed air. One has a single "floating" block or pad over which abrasive paper is clamped, and the other is a 2-pad machine. Both machines have been described and illustrated in previous issues of INDUSTRIAL FINISHING *Magazine, but are mentioned here as a matter of reference.*

Using a single-pad air-driven sander.

Basic Varnish & Research Expands

The Basic Varnish & Research Corp., 215 N. 10th St., Brooklyn, N. Y., has made an additional expansion in their business by acquiring an additional corner property adjoining their present plant. This will be used for a storehouse.

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Foreman Solves Defense Speed-up Production

BY ALFRED SAMOINE

More than tripling production on new rush work, with limited space, insufficient equipment and several inexperienced workmen—this was Red Sparks' problem. It appeared impossible according to past performance, but this is almost 1942. It was successfully accomplished; and it taught Red many things he had never known about himself or the management of his department.

▼ ▼ ▼

RED SPARKS, foreman finisher in a metal cabinet plant, was all that his name implied. He moved fast. He was quick and flashy. Except for one thing Red was like the sparks that fly from an emery wheel; Red didn't flash and then go out; he kept going. Coming from the superintendent's office he was going in great shape.

"Hell!" he exclaimed, "I wonder how the super thinks I'm going to turn out three times as much work and switch my department over to painting tanks for the army. Last year, we made 15 of them a week. Of course, we were not pushed then and we had only 500 to paint. But it's different now. The defense program puts a different aspect on the whole thing. . . . Three times as much, he said, and maybe more; and he wants me to give him an estimate on what I think will be necessary, and give it to him quick. Gosh that's going to be some job."

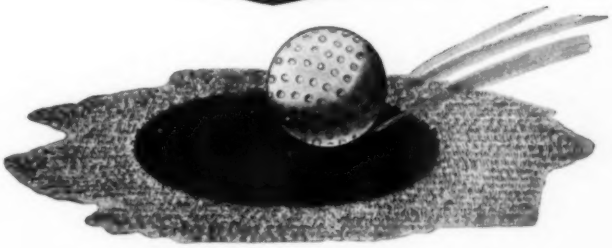
It was just 5:30 when Red walked into the superintendent's office and submitted his report.

"There it is Mr. Sanders."

The superintendent glanced at his wrist watch and then smiled at his red-headed foreman. "Right on the dot, Red," he said: "but I didn't expect you for half an hour yet. Suppose you sit down and tell me what's in this report. I'll look it over later."

"There's plenty, Mr. Sanders. First we will have to put on a lot more men and we will have to do it right away to get them broken in on the job. It means we will have to rearrange the whole department. We'll have to place our equipment differently so as to provide more floor space for handling the speeded-up program. We'll probably have to put on extra shifts. Maybe we will have to work 24 hours a day. And if we continue to make cabinets it's going to be some problem." *(Cont'd page 29)*

★ THE PAYOFF IS IN THE CUP! ★



If you're going to shoot par the last shot is just as important as the first. Likewise, if the finish on your product is going to be up to par or better every requirement must be met squarely.

Ferro's Vedoc technicians are experts in producing finishes that exactly meet production problems and product hazards.

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• • •

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"Yes, it's going to be some problem, Red, because we can't stop making cabinets."

"That complicates it, Mr. Sanders. I thought we might switch over entirely to the defense program."

"No, Red, our metal cabinets are used in the defense program too—that is to some extent—and we will have to keep on making them, but not so many, of course."

"But painting three times as many tanks a day as we did a year ago. It doesn't look possible."

"Red, we've got to turn out three times as many, to start with and then increase that. Does your report here cover the 50 tanks a week along with the regular run of cabinets?"

"No, it doesn't, Mr. Sanders. I figured that to turn out that many tanks we wouldn't be able to do much if anything on our regular stuff."

"You evidently misunderstood me. Here, take your report and go over it again. Give me another one tomorrow. You have the whole picture now. See what you can do. It's up to you, Red. You are the boss in your department. You're going to run the thing."

Red hurried back to his office with thoughts flying through his mind. "This defense setup is going to be . . . Well here goes. I suppose it will be up to me to handle all three turns. It is going to take three turns a day to keep up. I can see that right now. He said this morning three times as many tanks. That would be 45. Now this evening he says 50. Maybe by next week it will be 100. We can't train men fast enough for three turns daily at once, and I suppose I'll have to direct the new bosses on the second and third shifts. It will be high-pressure stuff all right."

Red buzzed home that evening with his mind working on a new schedule for his department. Discussing the subject with his wife at supper time, he declared, "I'm all pepped up about this defense work. We can't accomplish much by just plodding along in the old rut. We've got to work like we've never worked before . . ."

One month later Red was in the midst of the first radical departure from doing things the old way. He was really amazed at the things he had found it possible to do, once he set his mind to planning. He felt pretty good over the start he had made. It didn't disturb his setup much to place his experienced hands on the new jobs because, in getting started, regular work had to be deferred, leaving him practically free to place his men to the best advantage.

More Executive Pressure to Get Out More Production

Another month later, Red was notified to call at the superintendent's office.

"You're doing fine, Red," the superintendent said. "The defense work is going along about as we expected; but now that we have it started we must pick up the loose ends and make sure that our regular cabinet work does not lag. We have just received a large order for filing cabinets—a government order, of course — and they are to be finished in a special color to match the war department's color scheme."

"But, Mr. Sanders, I . . ." Red didn't get any farther.

"No buts in the program now Red", the superintendent declared. "We are going to make tanks and make our regular cabinets too. You will have to put on more men."

Red hesitated; then he said what

he knew the superintendent wanted to hear. "Okay, Mr. Sanders, I'll put 'em on."

"Yes, put on more men," he mused on his way back to his department. "But where will I have them work? Where will I get a bunch of new spray operators right off, even if I had extra spray booths for them to work in? Where will I put the work they spray, with the whole room full of tanks being finished? Trying to run two different commodities through the same bottleneck, dammit . . ."

"Hey, Sam," he called. "You get some white paint and paint a line on the floor, straight up through the room, about 20 feet out from the east wall there. A white line, 4-in. wide.

"Ben, you take your gang and start moving all the regular work inside that white line, Sam's going to paint. That's to be our regular finishing department from now on until—well maybe for the duration."

"How are you going to do all this work inside that white line, Red?"

"Don't know right now, Ben, but we will."

Employment Department Offers Only Inexperienced Help

Red marched over to the employment department and announced that he wanted four new spray hands and eight helpers.

"Spray hands?"

"Sure. Fellows experienced in handling a spray gun."

"You don't want much all at once. Don't you know experienced men can't be picked up, just like that?"

"Why not? There's plenty of fellows wanting work."

"Sure. But they are mostly just men."

"What do you mean?"

"Just what I said; just men without experience in any of our kind of work. Many of them come from the rural districts. They flock in here to get jobs in the factories. Some of these men are looking for their first real job. No sir, Red, I can get you plenty of helpers but no experienced spray hands."

"Okay, get me the helpers then."

Red scratched his head and muttered to himself, on his way back to his department. "No spray hands, and I got to have them, too. Guess it's up to me to hold school and teach them."

Monday morning Red interviewed some prospective workmen. He selected four and put them to work. That evening he had a talk with the employment man.

"When you hire men for me, Sam," he said, "be sure to select the right type. I prefer men of nervous temperment; the active quick individuals. You can tell that type by their mannerisms. Their eyes snap. They talk quick. Those kind of men can be pushed, speeded up. You can get a lot of work out of them and that's what we need now. If I have to teach men to work for me I want to be sure I'm teaching men who can produce."

Sam handed Red an application blank filled out by a man wanting work. "Read that Red. See if that is the type you want."

Red looked over the sheet carefully.

"This fellow has had several jobs Sam. Didn't last long at any of them though. What's the trouble?"

"That's just it, Red. He is one of those tempermental fellows like you asked for. Can't stay on a job because he flies off the handle and becomes unruly. Why, he lost his last job because he licked his foreman. You want that kind of a fellow?"

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"Sure. I'll take him. Ever hear the story about the fellow that sold a fine race horse because he could not manage him? A high-strung horse that was difficult to manage?"

"No. What about it?"

"Why the fellow that bought the horse learned how to handle him and then he went out and won races with him. You hire this chap. I'll take him."

Red put the new man to work. A few weeks later he was asked how the fellow was getting along.

"Fine", Red declared. "Really better than I expected."

"How's that", asked the employment man. "You must be a wizard."

"No. I just used a little common sense. Handled him differently than other men. I brought a little human interest into play. Got to talking to him one day and found out what his hobby was. I let him tell me all about it and I showed interest in what he told me. It has nothing to do with his work but he thinks I'm the best boss he ever worked for. He is pretty keen about that hobby of his and I make it a point to mention it to him occasionally. It keeps him in fine shape. He is a fine worker."

Red Explains About Doing the Impossible

Red Sparks' experience in successfully increasing the output of his department to 2, 3, and 4 times what it was formerly, is interesting, informative and timely. It is all based on what is actually happening in certain manufacturing plants today, so let's hear what Red has to say about managing a finishing department under speeded-up defense work conditions.

"I have to devise schemes and provide ways to do things that tax my ability, but somehow I get them done. I've even surprised myself with a lot of things I figured out—things that seemed almost impossible to do. I've found out that there is hardly any problem that cannot be solved, once you know that it has to be solved."

"I used to think I was a foreman but, compared with the things I'm doing now, what I formerly did was mere child's play. Every day was just about like any other one. Now it's different. You never know when a condition will bob up that you have to master and master quickly. I tell you it's a swell schooling for some of us men who have been functioning as foremen for several years, doing the same old stuff over and over, with little of the high pressure put on us. When we are suddenly thrown into this defense production we get jolted out of our lethargy.

"Some of us were pretty close to being in a rut. Not now though. We are keen eyed and alert; alive to the fact that something is doing every minute. If we are not, it's too bad.

"Another thing I've learned is that I had what you might call dormant ability. In other words, there were a lot of things that I didn't do because they were not required of me—things that were done by my superiors. Work came to me with the planning already done. All I had to do was follow instructions.

Higher Executives Too Busy To be Bothered by Foremen

"Now the superintendent and all other executives are burdened with new responsibilities and have little or no time to give to the department heads. This condition throws the foreman largely on his own resources. He must be able to ac-

This

CORE *baking* OVEN

DETAILS OF INSTALLATION

The Core Baking Oven, pictured above, is a 2-compartment design, equipped with a gas fired single heating unit of sufficient capacity to operate the oven at any temperature up to 500°. Compartments may be operated independently or in unison. Trucks, running on rails embedded in cement floor, carry work in and out of the oven through full-opening doors to each compartment. Automatic safety controls prevent premature firing. Control cabinet is attached to side of oven while heating equipment, fans and motors are mounted compactly above, out of the way. Thoroughly insulated throughout. Capacity, 40 tons per charge.

Now Drys in ONE NIGHT Work that Formerly Took 2 to 3 Days

Here is a Mahon Oven installation that is doing a remarkable job for a large Illinois manufacturer. Carrying a load of 40 tons, this oven actually drys in ONE NIGHT the same volume of work that previously required two or three days to turn out—*and the cores come out bone dry.* YOUR oven equipment should operate with equal effectiveness and economy. Call in a Mahon engineer. You will appreciate the technical knowledge he can bring to bear on your problem. Consultation incurs no obligation.

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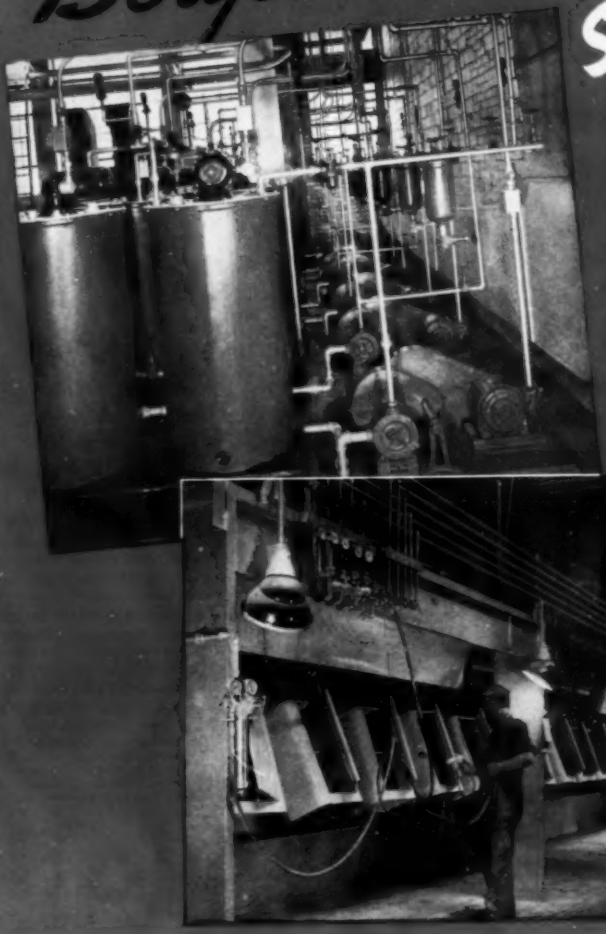
MAHON

Berger Points the Way to

STRAIGHTER



...thway to STREAMLINED FINISHING!

• The streamlined paint circulation system recently installed by the Berger Manufacturing Division of Republic Steel Corporation is an outstanding example of modernized finishing operations.

In the Berger plant at Canton, Ohio, two centralized mixing rooms now distribute paints of nine different colors, through nearly two miles of piping, to half a hundred locations where they are applied to shelving, cabinets, furniture and other metal products. The chief result is better finishing, through uniform control of pigments, viscosity, temperature and pressure. But the system also produces notable economies by eliminating excess handling, increasing storage facilities, reducing fire risk, and improving working efficiency.

DeVilbiss is proud to have cooperated in planning this important installation. It is also proud of the fact that DeVilbiss equipment is used exclusively, from mixing tanks to spray booths.

Manufacturers who seek finest finishing results, with assurance of maximum efficiency and long service, standardize on DeVilbiss.

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RELIANCE VARNISH COMPANY

INCORPORATED

LOUISVILLE KENTUCKY U.S.A.

cept this responsibility and that is where I began to make use of the ability that I didn't know I had. I had never been forced to do some of these things, which did not enter into the department setup, as far as my own responsibility went. The superintendent was always available. It was easy to ask him to make a decision regarding this, that and the other thing. I don't do that now.

"In the first place there isn't time to run to him. In the second place he is too busy with his own part of the program. And in the third place, if I'm not big enough to make decisions accurately and with dispatch, then I do not fit into the order of things as we now find them.

"Without bragging, I am bound to say, that I have become the brains of my department in the fullest sense of the word. I run my department just as if it belonged to me. I don't bother the superintendent. He has confidence in me or he would not permit me to continue on the job; and I know that the man who can run a department in that manner is the man who is making good. This hurry-up work most of us are now doing, is going to demand the best we have to give. And if you are at the head of a finishing department like I am, be prepared. Put yourself in a position so that you can really be a Department Manager."

"Pedro Says"

D' ya know, Joe? I betcha sumtime
Da Boss, he wish he hadda job like mine.
"Finishin' Foreman"! Ah! dat sounda fine,
But also it mean, "Keep everyt'ing in line".

Now w'en I go home, I no worry,
But boss, he run aroun' in flurry
To see that everyt'ing ees right
Before he go home every night.

You take a mornin' like today,
He t'inks that t'ings all o.k.
And den he fine that spray-man, Ned,
He ees spray da blue 'stead of da red.

The sand-man, hees name ees Ray,
He ees aholla for mo' pay.
Da ole conveyor goes on da blink,
Boss fine somet'ing broke a link.

Sam, he suppossa rubba da stain,
But he no remember to rub with da grain.
Jack, ess fello dat touch-up scratches.
Boss don't know he carry matches!

Da Smart-Alec, ees so full of pranks
Soon he be in da Army ranks.
Fred, hees breath with whisky reek,
He say he go on "wagon" nex' week.

John, Boss say he ees too slow,
But he not slow w'en noon whistle blow!
Pete, w'en Boss aroun' he worka fast,
When Boss ees gone, he maka work last.

On Jim da bucket spilla da paint,
Da guys all laugh, but Jim he ain't!
Lefty, he steals more stuff,
Maybe one day he get e'nuff.

Tho he has smile on ees pan,
I feels so sorry for that Finishin' Foreman.
Sumtimes he shake ees head and to me say,
"I wish dat you had been boss today."

I jus' tella you alla this, Joe,
That one time you will know.
I say to him, "If I hadda your job, and you hadda mine,
I betcha t'ings wouldn't be run one haff as fine".

—JUNE EVELYN VOIGT.

Painting Embossed Metal

Describing production methods of painting automotive license plates and similar embossed sheet metal signs which have raised or sunken letters painted in one color while the background is another color.

BY PAUL WALLACE

EVERYONE knows what an automobile license plate looks like. In most states it is usually a small, rectangular sheet of metal upon which appear the automobile registration numbers of millions of American motorists. The numbers appear in color against a contrasting background color for the main body of the plate. In addition, these numerals are embossed or stamped into the plate to insure maximum legibility and to make the plate and its lettering more indestructible.

Unfortunately, the majority of automobile license plates in this country are manufactured by convict labor, and for this reason, the methods of finishing this most common example of raised or sunken lettering are not widely known to the majority of private (and law-abiding) manufacturing concerns. This does not mean, however, that there are no other applications for this effective type of numbering or lettering.

Walk upstairs to your spray room and look at the metal "No Smoking" sign nailed to the wall. Look at the "Exit" signs over your fire doors. Observe the direction and destination signs on the stations, subway cars and trolleys on your way home. Before you enter your own house, take a look at the "No Peddlers or Solicitors" sign by your neighbor's door. And finally, when you drive out to the country, look at the state highway markers, at the price signs for gas and oil in the roadside service station, and at the innumerable, small "Hot Dogs and Soda Pop" signs near each refreshment stand.

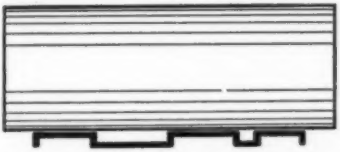
Yes, there is definitely a field for this type of metal sign, ranging from light sheet-iron signs made to last over the summer season, to heavy castings designed to remain legible for many years. Each type of sign requires a finishing method and system which will meet the requirements of each individual life expectancy.

Dipping; Spraying; Roller Coating

The commonly practiced methods of finishing such raised or sunken lettering are not many, and they are usually chosen on a basis of cost and simplicity of operation. Usually a combination of two or three coating methods are used. These comprise dipping, spraying and roller coating. The choice of these methods depends on the number of coats to be applied, the type of materials used, and the inherent physical characteristics of the stamped plate.

As can be seen from the accompanying drawing, the roller coating process is ideal in that it can be used to apply the background colors if the letters or numerals are depressed; or it will coat only these letters or numerals if they are raised, since color will be taken

Plates in Two Colors



Schematic diagram showing the sunken lettered plate passing under the applicator roll of a coating machine. The plate is viewed endwise and the depressed areas represent the downstroke and tail end, along the left side of the numerical 5. These sunken areas do not come in contact with the coating roll.

from the paint roller only by those surfaces which actually come in contact with it. This is the principle that makes this type of lettering economical from the standpoint of speed production. It eliminates entirely the tedious hand work that is necessary when painted letters are applied by brush, by masking, or by the silk screen method. This holds true whether the letters are raised or depressed, and whether the roller coating is applied from the top or from the bottom of the paint roll.

Roller-Coating the Raised Portions of Plates

Since the paint roller will not cover areas with which it does not come into contact, it is necessary to arrange the finishing system so that these areas are also painted. To this end, the following minimum operations are necessary to turn out a completed job:

First, the stamped plate is completely coated—front side, edges and back, in the color that is to remain in the depressed areas. This operation can be performed by either dipping or spraying. The choice between these will be seen later to be determined by the types and number of coats that are used. When this first coating is dry, the second color is then applied only to the raised portions by means of the paint roller. These portions have, of course, been previously coated by the first color so that the second application must cover this perfectly in one coat. This point is well to remember in choosing between sunken and raised lettering, or in determining colors for these areas, since the color of the raised portion of the plate must have rather good hiding qualities.

The foregoing paragraph describes the barest essentials for producing a 2-color job. While this is satisfactory for the cheapest type of work, it does not always meet the necessary requirements or specifications. For this reason, we must next examine the various systems that can be applied to such a plate, and try to determine the quality or advantages of the finished job.

4-Coat Finish; Synthetic Enamels

For the highest quality protection and the most beautiful appearance, 4-coat finishes may be applied to the better grade signs. Such a system, employing synthetic-type materials, would be as follows:

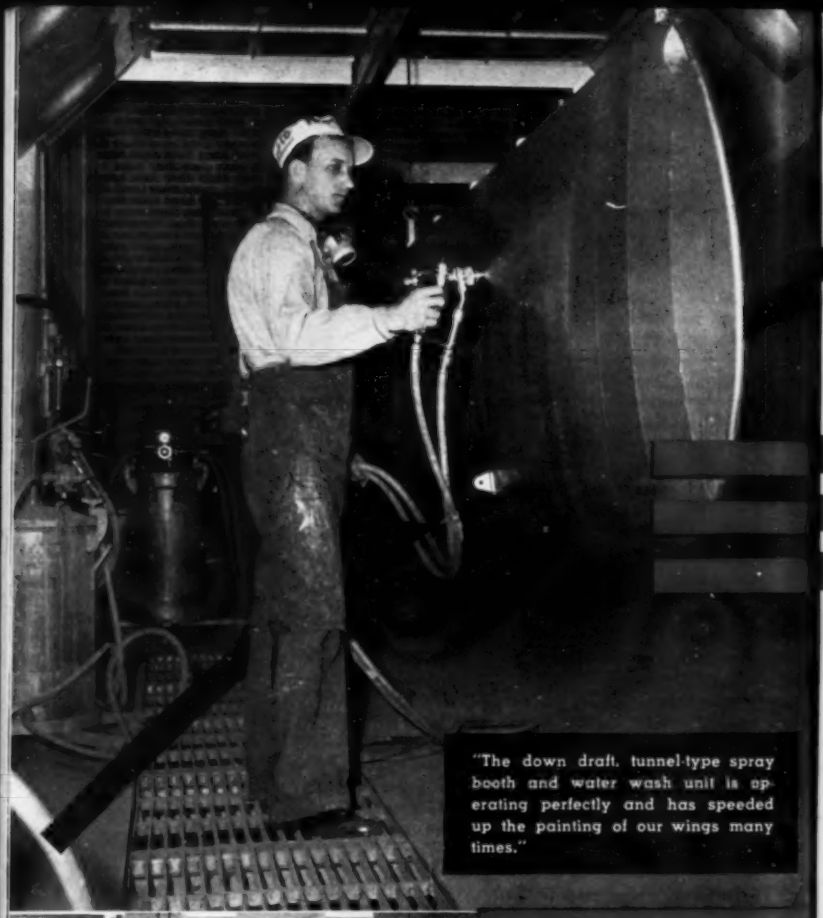
1) Air-dry or baked synthetic undercoat, dipped or sprayed.

2) Air-dry synthetic enamel, dipped or sprayed.

3) Air-dry snythetic enamel, roller coated.

4) Air-dry gloss synthetic clear, dipped or sprayed.

With such a 4-coat system, the



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". . . besides improving working conditions for our painters, due to the efficient lighting and high air velocities, these booths (Binks standard water wash spray booths) have enabled us to improve our production flow by placing them at the points where they are needed. This we can do because the cleanliness and efficiency of the booths no longer make them a fire hazard."

". . . the portable Dynaprecipitor unit allows us to paint our fuselages right on the assembly floor and saves us a good deal of moving of ships. . . ."

". . . the air supply system which your company installed in our paint shop is working nicely. We have an abundance of air, the circulation is excellent and the temperature is maintained accurately and uniformly."

". . . thank you for the courteous co-operation which we have always received, and for the high quality of the work which you have voluntarily done for us."

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finisher can obtain results which all 2-coat, and some 3-coat systems will not produce. In the first place, by dipping the undercoat (or spraying both sides of the plate) and then applying the next coat to only the face of the plate by spraying, it is possible to have a different color on the back of the plate.

Secondly, the application of the final clear coat to the front and back, or to the front only, will produce an excellent high gloss. Third, the combined four coats will, by sheer thickness of material alone, produce a finished plate of great durability and permanance.

Unfortunately, the time required for such a finish is unusually long since each coat, with the possible exception of the undercoat, if this is baked, will require approximately an overnight dry before the next coat can be applied. Of course, all coats may be speeded up by force drying at slightly elevated temperatures, but in no event is it advisable to really bake each coat, because by the time the final coat has completed its baking, the first coat will have been baked four times as long as it should have been, and this overbake may impair its durability and adhesion.

4-Coat Lacquer System

A much faster method of applying 4-coat finishes is to use faster drying materials such as lacquers. The lacquer system differs from the synthetic system in that several precautions must be observed, particularly in regard to dip application. The entire system follows:

1) Air-dry or baked lacquer undercoat, dipped or sprayed.

2) Air-dry lacquer enamel, sprayed (or dipped*).

3) Air-dry lacquer enamel, roller coated.

4) Air-dry or force-dry clear gloss finishing lacquer, sprayed.

The second coat may not be dipped when the undercoat has been air dried, nor can the final clear finishing coat be dipped under any circumstances, since lacquers, differing from synthetics which dry by oxidation, dry by evaporation of solvent; and any immersion of a previously dried film into a second tank of lacquer will cause the dry film to be softened by the solvents, and running and streaking troubles will most surely be encountered.

The baked undercoat, however, has been hardened by polymerization under the influence of heat, and is therefore no longer soluble. It is then safe to recoat by dipping, but only if such undercoat has been specifically recommended by the manufacturer as suitable for baking purposes.

3-Coat Finish; Synthetic Enamels

Three-coat systems are probably used more than any other because they are about the best compromise between durability of the coating and speed production, and there are more variations of these systems than there are for the 2-coat and 4-coat jobs. The first system is as follows:

1) Air-dry or baked synthetic undercoat, dipped or sprayed.

2) Air-dry gloss synthetic enamel, dipped or sprayed.

3) Air-dry gloss synthetic enamel, roller coated.

This system is quite similar to the 4-coat synthetic system except that the synthetic enamels used for the second and third coats must be especially chosen for high gloss, if such is to be the appearance of the finished product. The elimination

*It may be dipped only when undercoat has been baked.

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E. I. DU PONT DE NEMOURS & COMPANY (INC.), FIN ES D

E "RANGE PEEL" LEMON

...and the man who finished it off!

YOU'D be glum, too . . . if you made furniture but most of it was turning out to be *lemons* because of an "orange peel" condition in the finish. And obviously, if you operated a chain production line, you'd suffer from "slow-downs" in production if any part of the line would be affected.

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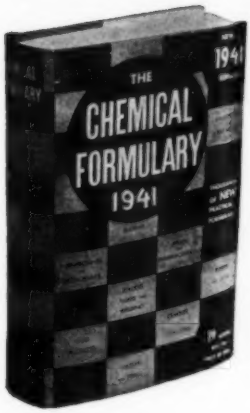

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of the clear gloss coat means that there will be one less item to purchase, store and use, thereby adding to the primary advantage of the saving of one drying period.

If, however, it is impossible to obtain sufficiently glossy results with even the best of gloss synthetic enamels, there is another way in which one of the previous four items can be dispensed with, and this is the following:

1) Air-dry or baked synthetic ground coat, dipped or sprayed.

2) Air-dry synthetic enamel, roller coated.

3) Air-dry gloss synthetic clear, dipped or sprayed.

The ground coat, as used here in the first application, is similar to the undercoats previously used in other systems. The only difference is that ground coats are a type of undercoat which are available in a greater variety of colors, and are capable of being matched to specific color standards. They are normally quite as dull in appearance as the undercoats themselves, but after the roller coating has been applied, the third and final coat of gloss synthetic clear will not only gloss up the exposed ground coat, but in addition will bring out the full color of its pigmentation.

The final result is that the plate has the appearance of being finished with two different colors of enamel, over which the clear has been used to further accentuate the gloss, but the use of the undercoat type of ground coat has added greatly to its toughness and long life.

3-Coat Lacquer System

The two remaining 3-coat finishes are composed of lacquer systems and parallel closely those of the synthetic type.

1) Air-dry or baked lacquer undercoat, dipped or sprayed.

2) Air-dry gloss lacquer enamel, dipped or sprayed.

3) Air-dry gloss lacquer enamel, roller coated.

In this and the following system, caution again must be exercised in choosing when to dip one lacquer over another, according to whether or not the preceding coat has been baked.

1) Air-dry or baked lacquer ground coat, dipped or sprayed.

2) Air-dry lacquer enamel, roller coated.

3) Air-dry or force-dry gloss finishing lacquer, sprayed.

2-Coat Finishes

These finishes represent the minimum number of coats that can be applied to the license plate type of sign to produce letters and backgrounds of contrasting color. Because of the rapidity with which these systems may be applied, they are probably the most popular and widely used of any. The elementary system is:

1) Air-dry or baked gloss synthetic enamel, dipped or sprayed.

2) Air-dry gloss synthetic enamel, roller coated.

The corresponding lacquer system differs slightly in that another type of baking principle can be involved, thus giving us two different methods. The first and most ordinary one of which is:

1) Air-dry or baked gloss lacquer enamel, dipped or sprayed.

2) Air-dry gloss lacquer enamel, roller coated.

The newer and increasingly more popular system is one in which both lacquers are of the baking type, but they will set sufficiently hard by solvent evaporation so that the panel can be roller coated while the first coat is still unbaked.

1) Air-set, baking type of lacquer enamel, dipped or sprayed.

2) Air-set, baking type of lacquer enamel, roller coated.

When both coats have been applied, the entire panel is baked and both coats are cured as one. This is a method which, although it can be applied to certain synthetics, is more applicable to lacquers because their relatively lower solid content produces a 2-coat film which is not too thick to bake through thoroughly. Needless to say, such a system is infinitely more durable and will have a generally longer average life than one which has been air dried, or one in which only one component has been baked.

No compilation of finishing methods for sunken and raised letters would be entirely complete unless the newer urea-formaldehyde and melamine types of finish were mentioned. Both of these are sold under a variety of trade names which, in very few instances, are identifiable with the type of materials they contain. They are, however, generally known as "quick-baking" enamels, and their curing periods in the oven vary between ten minutes and one-half hour. They are tough and durable, and offer excellent protection even though only two coats are applied. The following elements of the system do not appear very much different from any other 2-coat application.

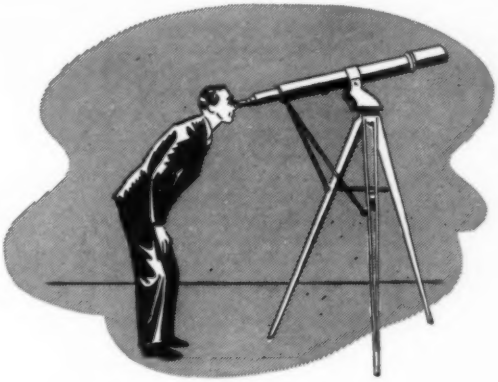
1) Quick-baking synthetic enamel dipped or sprayed.

2) Quick-baking synthetic enamel, roller coated.

The trick in applying these is in the manner of baking employed. Unfortunately, enamels of this type do not air dry to a stage where they may be handled or roller coated. If the first coat is fully baked before the second is applied, there is the everpresent danger of overbaking during the second trip through the oven. The problem is solved by subjecting the first coat to a partial bake which is just sufficient to set the film for further operations, without hardening it all the way through. When this has been accomplished, the final roller coat can be applied and both coats are then baked as one. For exact details of the heat-setting treatment it is best that the manufacturer of the enamel be referred to.

In conclusion, it may be pointed out that the first coat of a 2-coat system is most generally dipped, rather than sprayed, since this is the only way in which the back of the plate can be coated.

Carved pulls on this bone white lacquered chest exemplify the new trend in decorative modern which will be featured at the fall national home furnishings market at The American Furniture Mart. This chest is maple and the chair is upholstered in a blue satin stripe fabric. Photograph, courtesy of the American Furniture Mart.



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Tumble Finishing

(Second and Final Installment of Article)

BY R. J. FAIRBURN
Zapon Division of Atlas Powder Co.

ONE CONCERN tumble-finishes handles or dowels that are ½-in. in diameter by 30-in. long. This presented a real problem, especially in a barrel 64-in. long. As the barrel revolved, the dowels would work endwise. With a few revolutions of the barrel, enough of them would begin to work crosswise to the load so that the work no longer tumbled. It became a static mass. Then it was necessary to dump the load, even up the dowels and reload the barrel.

This condition was overcome by putting a partition in the barrel —one that permits only ½-in. of end play. Two such partitions permit a double load to be placed in this particular barrel. Instead of only a half barrelful, as is desirable for most work, this barrel is loaded to about 80% of its capacity. A shaft running through the middle of the barrel helps to keep the work in proper position.

In this way the dowels stay in the barrel long enough to receive an evenly distributed coating of material. The company insists that this tumbling provides a cheaper and more satisfactory finish than dipping.

A synthetic resin enamel with a high gloss is used, so that a tumble polish is not needed. The work will not remain straight long enough to permit a polishing operation. This enamel is not desirable for most work, as it requires an overnight dry. With lacquer, a half dozen loads can be finished in this same length of time.

In this particular case, the wood first used was a cheap grade of hardwood. So many pieces were crooked and had knot holes that it did not tumble well. The job does not permit too much cost for wood. The use of soft wood, which does not tumble well but which is straight, solved this problem.

If the barrel runs too long, fir and pine dowels will become rough and splintery. Tumbled just the right length of time, a smooth bright finish is obtained in red, green, blue and yellow colors.

Tumbling Irregular Shapes

One concern saws doll furniture out of solid blocks of maple. As one may well imagine, the chairs, beds, dressers and tables are very irregular in shape. None of them tumble too well when sorted, but tumbling all kinds of pieces together, the smaller pieces find their way into the irregularities of the larger pieces and tumble satisfactorily. Small wooden beads, used

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as tumble jacks will often help with such work. They are not used to break the work apart but to create greater friction and a better distribution of the finish.

Cleaning the Barrel Interior

When using lacquers and synthetic enamels it is not usually necessary to clean the barrel. The inside quickly becomes coated with the material and this is desirable. One barrel must be provided for each different color, as it would be very difficult to remove all of the color from a barrel to permit using it for another color. In rare instances, this is accomplished by washing the interior with thinner.

When using some clear materials, like shellac for instance, the finish will eventually flake off and adhere to succeeding barrels of work. In this case the barrel should be cleaned as needed. A spark-proof scraper should be used after which the barrel can be washed with a solvent.

Editor's Note:—To make this article more complete, the author suggests that we quote the following paragraphs about Tumbling With Shellac, from Thomas F. Richardson's article on "Tumble Finishing", as published in November 1940 issue of INDUSTRIAL FINISHING.

"Tumble finishing with shellac is somewhat different than finishing with enamel. Neither oven nor trays are needed and the barrels are hexagon instead of round. The hexagon type of barrel produces extra motion in the pieces to be finished, thus preventing them from sticking together. The speed of the barrels should be 25-r.p.m.

"For handles that are not flat, shellac is applied with no reduction. Machine oil, added to the shellac, prevents the pieces from sticking and prevents the gloss from being rubbed off while tumbling. After the tumbling operation the oil is on the surface of the shellac and can be removed by tumbling with rags, if wax is to be applied.

"Enough shellac is used on the batch to cover the handles. When this has set up, more shellac is added and the barrel is again started. Applications are made in this manner until the desired finish is produced. If the objects tumble too long, the gloss will be impaired, so they have to be watched closely.

"After the shellac barrel has been in use for some time its ends will be unevenly coated with semi-dry shellac which comes off in bunches on the pieces. Washing with alcohol or lacquer thinner will remove this coating.

"Wax is sometimes applied over the shellac. The shellac will have to thoroughly dry before wax is added, as it will not dry afterward. Liquid wax is much better than hard wax. Often hard wax leaves translucent flakes and small spots on the finished job."

Tumble-Finishing Metal Parts

The tumbling method has been used for many years for finishing small pieces, such as buttons, washers, screws, etc. More recently, synthetic-resin enamels, in a variety of colors, have been developed for this work. This has extended the field for finishing a variety of small parts.

For this work, a tilted, open end, metal barrel is generally used. The barrel should be rotated about 20-r.p.m. The work must be free from dirt and oil.

The articles to be tumbled may be cleaned with alkaline cleaners, cleaning solvents, a degreaser, or

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whatever means is available. No finish adheres well to a dirty or oily surface, so this cleaning operation should be thorough. For some die castings and other surfaces that are greasy, or which exude oxides, I suggest the use of one of the cleaners that also etches the surface of the metal.

The tilted, open-top barrel may be filled about one-third full with metal parts to be coated. The enamel is poured over the work and the barrel is started rotating. An experienced operator will soon determine how much enamel is needed to thoroughly coat the work. Since the barrel is open, he can observe the progress of the operation at all times.

A Metal Tumble-Finishing Job

A typical example is a small barrel that holds about six gallons of small parts. A pint of enamel is generally sufficient for this job. The covering capacity of this enamel is nearly double that of lacquer.

About one minute is required for all parts to be coated. A quantity of solvent, such as toluol, is then poured over the work as the barrel revolves. This solvent causes the enamel to flow out properly. For the barrelful that requires a pint of enamel, one and a half pints of toluol is used.

One might wonder why the toluol is not just added to the enamel in the first place. The reason is that such an enamel will not have adequate hiding properties. The heavier enamel hides the work and "sets" on the surface but it is not smooth. Solvent, added later, flows out the finish without washing it off.

After the barrel has revolved about a minute to flow out the finish, a jet of air is turned on and, with this air playing on the work, the barrel runs about a minute. This air dispels the solvent vapors and surface-dries the work.

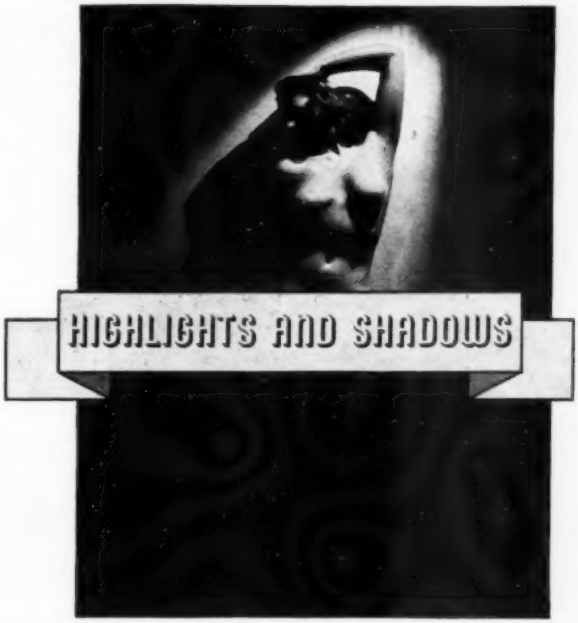
This whole operation requires about three minutes. If air is not used to dispel the excess solvent, a somewhat longer time is required for drying. The work is then dumped onto trays for drying.

An open-end adjustable-tilt barrel is excellent for tumble-finishing small work.

The enamel will dry hard, at room temperature, overnight. A tougher finish will result if it is dried in an oven for two hours at 160°F. It reaches its maximum toughness and hardness when baked one hour at 250°F. Some colors will permit baking for a shorter length of time at a slightly higher temperature.

To Prevent Flat Pieces From Sticking Together

Even flat pieces, like washers, are not always inclined to stick together. If there is some sticking, it can usually be eliminated by adding a few drops of some slip agent (like pine oil) to the enamel. This gives the surface enough lu-



Just as the photographer knows that the right highlights and shadows bring out the best in a photograph, we know that a good finish brings out the best in your product.

Anyone can take a picture, but it takes a true artist to bring out the best in a photograph. The same is true in our line—we have our own creative studio where artists conceive the very best attention-compelling and protective finishes for your product, whether it is wood, plastic, or metal. And improving the finish does not necessarily mean increasing the cost.

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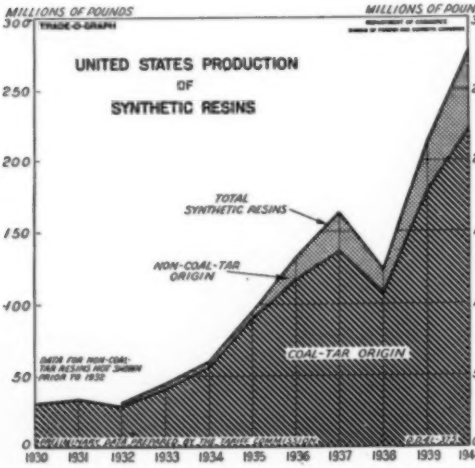
brication to prevent sticking and is not noticeable in the cured finish.

If the work does not seem to have enough tumbling action, a fin or cone may be fastened to the bottom of the barrel. This will cause the work to be tumbled over it. In some cases, an operator stirs the work with a stick as it tumbles. However, this is seldom necessary.

In conclusion, I quote a paragraph from R. T. Williams' article in August 1940 issue of I. F. Mr. Williams says:

"To speed up the tumbling operation, one tumbling barrel concern has incorporated into its design a triple-action work-shifting bottom. This is an exclusive and patented feature. When the machine is in operation this work-shifting bottom forces the load to shift alternately forward and backward as well as being tumbled around in the revolving barrel. This causes a more thorough agitation, with uniformity in the finish of the parts, in less time than is possible with the ordinary flat-bottom barrel." This refers to a tilting type of tumbling barrel.



Book About American Mahoganies

An interesting and informative book of 32 pages about the American mahoganies has been written by Samuel J. Record and published by the Mahogany Association, Inc., 75 Wacker Drive, Chicago, Ill. Write the association if you are interested in securing a copy.

Catalog of Baking Ovens

An 8-page bulletin 8½ x 11-in., printed in two colors and attractively illustrated, has just been released by George Koch Sons, Inc., 2112 Pennsylvania St., Evansville, Ind. Quoting from the catalog:

"The basic oven illustrated is a GKS Standard truck-type oven, No. SG-21-10. This is a gas fired oven with a 2-position indicating temperature controller and a heater of 100,000-b.t.u. capacity. To this unit additional compartments and additional 2-ft.4-in. sections in depth can be added to produce a larger oven. The same basic parts are used in each of these ovens, showing how they can be increased in size either at the time of purchase or later as increased production is required.

"An electric or gas-fired heater of any required B.T.U. capacity can be furnished for the truck-type oven. The basic unit has a 100,000-b.t.u. heater; others of standard capacity are available up to and including 3,000,000-b.t.u. per hour. Steam or oil-fired heaters are also available."

The catalog explains the merits of Standard truck-type ovens, the flexibility which they offer, as well as details of their construction, operation, and the safety and control equipment furnished with each unit.

IS YOUR FINISHING ROOM A HEAD-ACHE?

DO YOU HAVE TO USE FINISHES YOU NEVER USED BEFORE? Or raw materials that are new to you? Or new finishing processes? . . . All on top of having to speed up production?

Maas and Waldstein can probably help you, if these or any other finishing-room troubles have come your way. M & W has developed many special lines of finishing materials for defense and civilian needs. Its research laboratory has specialized in solving finishing problems for years.

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See M & W's exhibit of defense, emergency, and speed-up finishes at the National Metal Exposition, Philadelphia, Booth No. A-15.

Polishing Wheel Glue

The Lea Mfg. Co., Waterbury, Conn., announces Ad-Lea-Sive, which has proved to be successful for the following uses:

1) As a complete substitute for polishing wheel glue in which it is used not only for precoating the wheel but also for bonding the grain to the wheel.

2) As a simple precoating material for a clean polishing wheel after which ordinary glue and grain are applied in the usual manner.

3) As a precoat on sewed buffs and polishing wheels prior to the use of Lea compound for producing set-up wheels comparable to standard wheels 120 grit and finer to be used on ferrous metals.

The company declares that its special treatment has made Ad-Lea-Sive highly resistant to bacterial action, which quickly spoils ordinary glue when left in the glue pot.

As shipped, the material is a firm jelly-like substance which, in the cold state, is almost jet black. It is packed in various size containers from which it can be easily scooped out. One gallon equals approximately 8½-lbs.

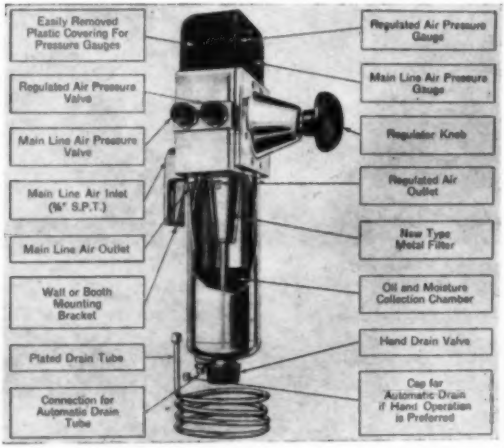
New . . .

MATERIALS SUPPLIES EQUIPMENT

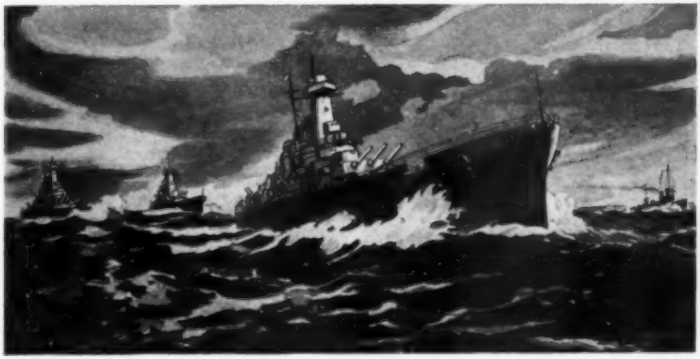
Oil & Water Extractor

The Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., has just announced the marketing of a new large-capacity oil & water extractor, known as Binks E-75. This new extractor has a rated capacity of 75-c.f.m., at 60 to 70-lbs. pressure, and has two main-line air outlets, as well as two regulated air outlets.

Designed to meet the needs of a larger capacity extractor, and ample to handle the air needs of several modern spray guns at low or high pressure, the new E-75 incorporates all the latest feature of modern streamlined designing. It includes a new air-cleaning principle with a highly efficient metal filter, which thoroughly


Easily Removed Plastic Covering For Pressure Gauges
Regulated Air Pressure Valve
Main Line Air Pressure Valve
Main Line Air Inlet (¾" S.P.T.)
Main Line Air Outlet
Wall or Booth Mounting Bracket
Plated Drain Tube
Connection for Automatic Drain Tube
Regulated Air Pressure Gauge
Main Line Air Pressure Gauge
Regulator Knob
Regulated Air Outlet
New Type Metal Filter
Oil and Moisture Collection Chamber
Hand Drain Valve
Cap for Automatic Drain if Hand Operation is Preferred

This diagrammatic photograph shows several interesting details of the E-75 oil and water extractor for use in compressed air lines.



Surface Protection

AS A BATTLESHIP stands guard on the surface of the sea, so do **Egyptian Finishes** stand guard on the surface of your product.

Egyptian Finishes have been doing a fine job of surface protection on thousands of products for over a half century. As a result they have come to be recognized as a standard of comparison wherever finishes are used.

The complete **Egyptian** line includes all types of standard finishing materials . . . colors, clears, air-dry, bake . . . spray, dip and brush.

We would be glad to tell you more about **Egyptian Finishes.**

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cleans, but does not impair the free flow of air.

Another feature is the more uniform air pressure obtained, due to a new and improved large-capacity air regulator, which is part of the unit.

Composition Metal Foil

Complete substitution of non-essential composition metal for aluminum foil has been announced by the Display and Container Division of the Reynolds Metal Co., Richmond, Va., largest manufacturers of foil in the United States.

Before the present shortage of aluminum, the Reynolds research laboratories began experiments with foils of other metals, and various plastics and substitutes. Because of this research, the new composition metal packages were ready for market as soon as the demands of defense production took over all available stocks of aluminum.

These new containers of composition metal foil are finding ready acceptance in the food field, according to J. Louis Reynolds, general sales manager of the company. The foil presents opportunities for brilliant display. Gold and silver backgrounds for embossed and printed labels and packages predominate in early deliveries of the new composition metal.

The containers are made of highly calendered paper board with foil on the outside, and with a clear plastic over a sized clay coating on the inside. The eye-appeal of these flashing metal containers has been responsible for increased sales in several recent tests, according to Reynolds officials, who say the composition metal foil also makes excellent flexible packaging material for food products.

Test Fabrics for Gas Resistance

A new instrument, the Fabric Permeameter, provides an accurate, rapid and convenient means for production testing of the permeability of fabrics which are to inflated with hydrogen, helium, carbon dioxide, etc. The rate of permeation through the fabric is quickly determined by equipment utilizing the thermal conductivity method of gas analysis and is indicative in terms of "litters per square meter per 24 hours" of the retained gas.

The Fabric Permeameter determines the rate of diffusion, of hydrogen and other gases, through balloon fabrics and other materials, and it enables a

Instrument developed by the Cambridge Instrument Co., New York, N. Y.

testing of the effectiveness of various "dopes" with which the fabrics are treated. Lateral diffusion as well as leakage at seams can be determined by the use of this instrument.

Manufacturers of fabric for lighter-than-air craft, line rafts, life jackets, gas masks, etc., as well as rubber manufacturers and producers of lacquers and chemicals for impregnating textiles, are especially concerned with fabric permeability.

Bottle Label Lacquer

Labels used on bottles of cosmetics and pharmaceutical products and many other uses withstand rigid tests and severe usage. The surface must be scuff-free and marresistant.

Labels must retain flexibility so that they may be applied without breaking the finish. The original color must be water white and must not noticeably discolor on aging. The lacquer must adhere to various types of paper and to various printing inks.

There must be good resistance to grease, oils, chemicals, alkalis, acids, etc.

Lacquers suitable for labels must be adaptable for use on standard coating machines and under standard production schedules.

Zapon paper lacquers have been developed to meet these various specifications, according to the Zapon Division of the Atlas Powder Co., Stamford, Conn.

No Blink Starter Switch

A new "no-blink" starter switch, which will end a flourescent lamp's life when it has reached the stage where it blinks on and off, has just been announced by the commercial engineering department of the Westinghouse Electric and Mfg. Co., Bloomfield, N. J.

The new switches are to be interchangeable with present FS-4 two-contact switches for operating 40-watt Mazda F lamps. They will be

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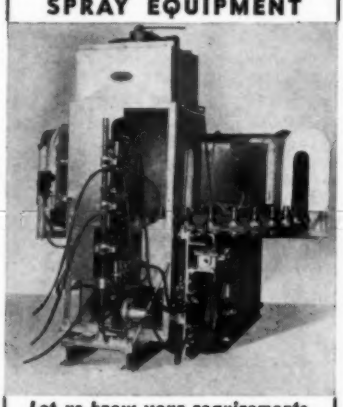

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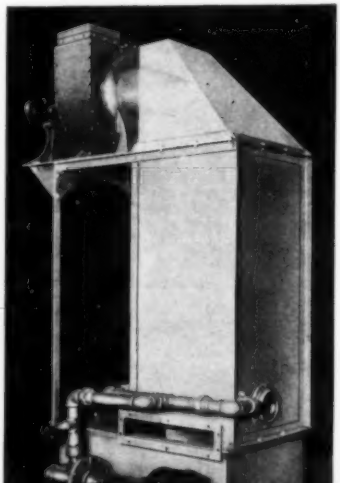
ECLIPSE AIR BRUSH CO.
392 Park Ave. Newark, N. J.

available in October in limited quantities. Orders from defense industries will be given preference and other orders will be filled as production increases. The "no-blink" switch will be more expensive to manufacture and thus will sell for more than the present FS-4 switch.

Hydro-Whirl Dust Collector

Dust, created by buffing, polishing and grinding of manufactured parts, is effectively trapped by the new Hydro-Whirl dust collector developed by the Industrial Sheet Metal Works, 626 E. Forest Ave., Detroit, Mich. This dust collector removes all of the hazards that have attended the processing of magnesium and its alloys. Practically all of the insidious dust is removed from the area of operations and is transformed into an inactive



View of a Hydro-Whirl Dust Collector

element in the form of a sludge which is later either burned or buried.

Many units are already in use by leading parts manufacturers who are now utilizing magnesium in larger volume. The outstanding performance of these units has attracted the attention of a number of renowned chemical engineers whose chief interest is safety in industry. Insurance companies and fire protective associations, too, have recognized the safety factors apparent in this new development.

The Hydro-Whirl is an entirely new principle in wet dust collecting and is effective on all types of metal dust, not only magnesium but aluminum, iron, steel, and others as well. The working mechanism consists of a rotating shaft on which are centered a series of discs. The controlled rotating speed of the shaft in a horizontal plane throws a rain of water into the baffled section of the unit at which point the dust is whirled out of the air stream. Scientific calculations have attained a proper balance between the velocities of air and water. This balance insures thoroughly cleaned air which may be returned to the building.

New Regalvanizing Rustproofing Process

With U. S. Patent 2,224,953 granted and others pending, Galv-Weld, Inc., Mutual Home Bldg., Dayton, Ohio, is making available to the metal fabricating industry its new process which permits the welding of galvanized or other sheets and structural metal parts, regardless of size, so that the joints are left in thoroughly rustproof condition.

In the case of welded joints of galvanized material, regalvanizing is accomplished at the time of welding and no redipping is necessary. It is said that welded products can be manufactured from galvanized sheets or shapes, eliminating entirely the present practice of dipping the finished product to rustproof it. Where the product is of such size that it cannot be dipped, the advantage is obvious.

FORM - A - ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

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We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

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Baking schedule is of great flexibility, permitting from 5 - 50 minutes at 250 - 375° F.

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No matter which of the present worthy finishes of this type you may be using or planning to use we sincerely recommend that you investigate

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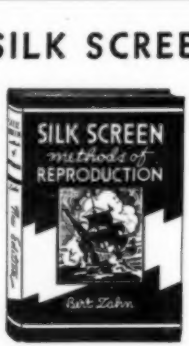

THIS new book is intended for Sign Painters, Card Writers, Display Men, Furniture Manufacturers, Novelty Manufacturers, Glass Etchers and for Domestic Use.

Every detail of the silk screen process is presented clearly in detail. All equipment is fully described and its use illustrated. All materials needed in the various kinds of silk screen work are mentioned with respect to their use to advantage. Estimates of costs and prices to charge are given.

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INDUSTRIAL FINISHING

1142 North Meridian Street Indianapolis, Ind.

The process and materials are adaptable to all types of welding.

An additional feature of the Galv-Weld process is that it permits the painting or enameling of a welded joint without danger of sweating. The necessity of applying a filler coat before finishing such a joint is eliminated. A Galv-Welded surface can be baked.

National distribution of Galv-Weld materials to licensed users of the patented process is assured through the sales organization and distributors of the Metallic Products Division of The Eagle-Picher Lead Co., Cincinnati, Ohio.

The process has been used successfully by its developers for over four years on light and heavy galvanized angle-iron frames, many of which have been subjected to all types of extreme weather conditions, but is now being offered for license for the first time.

While it is apparent that this economical rustproofing process will be used in practically all welded products, it would seem to present particular significance to the ship-building and general contracting trades, to manufacturers of tanks, cans, barrels and other containers, pre-fabricated steel houses, and to railroad car, airplane, truck and armament builders.

Gives Luster to Metal

Metal articles finished by oxidation processes, phosphate treatment, etc., are rendered lustrous and resistant to corrosion by immersion in a solution of Hydrowax Liquid N Light.

In general, the Hydrowax Liquid N Light may be diluted to the extent of one part of Hydrowax to three parts of water, for the treatment. If unusually high resistance to atmospheric corrosion is desirable, the Hydrowax

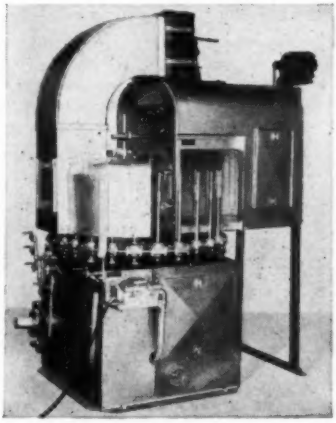
Liquid N Light may be used without dilution.

This treatment is particularly useful for the improvement of luster after coloring by the jetel process and other processes which use molten salt baths or solutions of salts for the production of black or other oxide films. The use of Hydrowax Liquid N Light is of particular interest at this time, since the metal shortage has created an unusual demand for highly efficient materials which may be applied to improve surface luster and impart corrosion resistance.

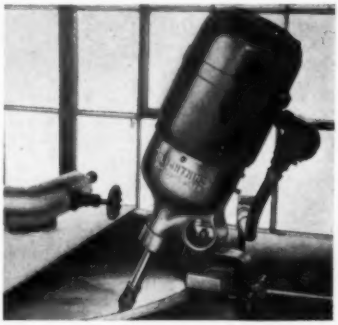
Small Shell Sprayer

An automatic spray machine to coat and dry the outsides of small shells (20 to 40-mm.), gernades, shot, or boosters, has been built by the Eclipse Air Brush Co., 400 Park Ave., Newark, N. J.

The machine consists of an automatic turntable on which the pieces are carried on indexed spindles to a position in front of automatic spray guns in a booth equipped with exhaust fan. After being coated, the pieces go through a small oven opposite the



A compact automatic production machine.



Direct Drive "LIGHTNIN" Portable Mixer used for maintaining proper consistency and suspension of pigment in a special enamel. Where colors vary frequently and quantities are not too large, this type of agitator can be conveniently changed from one tank to another.

KEEP PIGMENTS IN UNIFORM SUSPENSION AND REPLACE EVAPORATION LOSSES WITH A "LIGHTNIN" MIXER

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spray booth. A unit heater with blower fan insures rapid drying so that the pieces can be removed manually as they emerge from the oven.

The whole unit is very compact, taking a floor space of only 4-ft.x4-ft., and working parts are enclosed wherever possible to keep down maintenance costs.

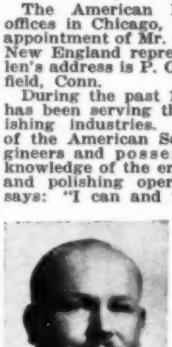
A. G. Spencer Joins Rudd Lacquer Corp.

Mr. A. G. Spencer, formerly president and partner of the Lenoir Woodfinishing Co. has joined the Rudd Lacquer Corp. of Rahway, N. J. as their Southern representative. Mr. Spencer, who is well known to the furniture trade in the South, will continue to make his headquarters at Lenoir, N. C.

American Buff Co. Announces New England Representative

The American Buff Co., general offices in Chicago, Ill., announces the appointment of Mr. Charles R. Allen as New England representative. Mr. Allen's address is P. O. Box 65, Wethersfield, Conn.

During the past 15 years, Mr. Allen has been serving the buffing and polishing industries. He is a member of the American Society of Tool Engineers and possesses an unusual knowledge of the entire field of buffing and polishing operations. Mr. Allen says: "I can and will help any customer on his plating as well as his polishing and buffing problems. My many years as a production expert has qualified me to eliminate much lost time and to produce greater efficiency."



Charles R. Allen represents the American Buff Co. in New England states, helping the company's customers with all polishing and buffing problems.

Mr. Allen is particularly experienced in working with ever improving modern methods of buffing and polishing. Due to his training, he has been very successful in making complete layouts and installations.

Limed Oak Finish

Will you please advise us regarding the details of finishing oak wood surfaces by the new process called "liming"? Modern furniture with this finish is called "Limed Oak." If you have any suggestions regarding the finishing of wood to obtain a lighter than normal color, I would appreciate receiving the same.—S. A. Co. (Aircraft).

Editor's Note: See the Q & A under the above title in September 1941 issue, pages 64-65. Also, we have just received the following article on the subject from John F. Wagner, of Spanjer Bros., Inc.:

Our method of finishing limed oak or silver gray oak is as follows: The wood used is selected white oak, therefore the use of any bleach is unnecessary. The work is well sanded and must be inspected carefully for any imperfections. Assuming that the work is in A No. 1 shape, it is given a coat of water stain, depending on the particular shade the specifications call for, such as nigrosene and aniline powdered stains. After this stain dries, the surface is sandpapered carefully and then given a coat of clear lacquer sealer.

When the sealer is thoroughly dry, the surface is again smoothed the same as after the application of water stain. A coat of white wood filler is then applied. Of course, this wood filler can be tinted with any oil pigments such as raw sienna, burnt umber, raw umber, black, etc. This tint, of course, would be to match shades on specifications. This filler coat is applied with a brush, making sure to brush across the grain. After this material sets, but is not dry, it is wiped off with wiping rags, rubbing across the grain.

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

The pores of the wood then contain this filler, leaving a limed oak finish which is sometimes called silver gray oak finish. This is allowed to dry overnight and is then finished with another coat of clear sealer and one to three coats of clear lacquer. When the clear lacquer is dry, the surface is rubbed down with a rubbing compound and polished with a good wood wax.

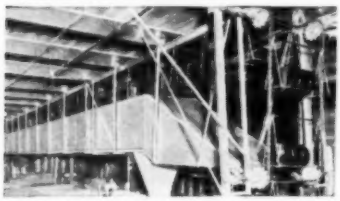
Finishing Philippine Mahogany

We would like to find some successful methods for producing a high grade finish on red Philippine mahogany. We have been unable to secure a full finish on this wood by using the customary 2-coat job in lacquers, although the lacquer is of the royalty high-solids type. Pock marks and pinholes seem to get into the film surface and result in a poor finish. All materials used are from reputable manufacturers and are their medium to highest grades.

One set-up is to stain, wash-coat, fill, seal and lacquer, sanding between coats. If you should know of a better set-up, in line with the

FINISH BAKING FOR DEFENSE NEEDS DESPATCH EFFICIENCY

- Proper body construction.
- Proper heater equipment.
- Proper heat distribution and air circulation.
- Proper material handling.



This conveyor type oven used for baking finish on oil drums.

WRITE FOR BULLETIN NO. 51-K

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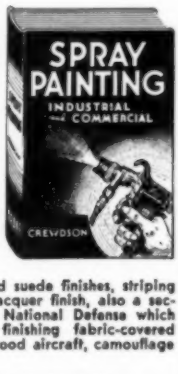
Industrial Spray Painting

Contains more than 125 pages. Fully illustrated. Cloth. Price.....$1.50



This new book covers the fundamental principles of spraying technique, together with the latest developments and practices of this craft. Covers common paint pigments, paint extenders, enamels, oil and spirit varnishes, shellac lacquer, synthetics, all types of modern air guns, spraying technique, spraying standard materials, spraying defects, their cause and remedy, flock and suede finishes, striping and lettering, pearl lacquer finish, also a section on spraying for National Defense which covers cantonments, finishing fabric-covered aircraft, finishing plywood aircraft, camouflage painting, etc.

INDUSTRIAL FINISHING
1142 N. Meridian St. Indianapolis, Ind.

above procedure—one that would not involve too great an expense—it would surely be appreciated.—S. G. F.

Your schedule of operations is similar to what many others are using. However, your filling may not be thorough or you may be allowing your filler insufficient time to dry. Pinholing is usually the result of improper filling of pores in the wood or the application of a final finish coat over another coating that has not become completely dry.

Pitting is generally caused by the presence of moisture or oil in the compressed air you use for spraying. The remedy is to use a clean suitable type of device that completely filters out all water and oil from the compressed air.

Our guess is that your filling is at fault. Perhaps the filler isn't padded into the wood pores thoroughly. From a foreman finisher's article in a past issue of INDUSTRIAL FINISHING, we quote the following recommendations:

Philippine wood (often called mahogany) worked into furniture, contains many different shades of color. The only way to bring these different shades together into a harmonious ensemble is to use some type of stain on the raw wood.

I am finishing some nice suites now. I have the wood glue sized; then this surface is sanded down to make it smooth. We apply a coat of water stain and use a wash coat of lacquer sealer, and sand the sealer. Then we apply a coat of filler mixed to 10-lbs. to one gallon of thinner. Our men take a felt block about 6x10-in, and pad the filler into the pores and rub it across the grain. When it has dried four hours, we refill

all the tops and fronts; after the filler dries overnight we apply a coat of lacquer sealer.

When the sealer is sanded down smooth, the next operation is a coat of mahogany wiping stain. We rub this stain off and also take a 4-in. filler brush and blend the stain to a uniform color on the wood. After the stain is dry we apply two coats of lacquer. When the lacquer is dry we rub this with pumice and oil, and use a clean-up polish to remove all the oil from the work. This leaves a nice clean finish, free from finger marks.

You can apply a coat of non-grain-raising stain to Philippine wood, and you will have a nice color to start with. Then apply the wash coat and filler, and also use the wiping stain, as you almost have to use two stains to match up the different colors of wood. Philippine mahogany, when finished right, has a mellow orange-brown color. It is beautiful when finished as outlined above.—EDITOR.

Maas & Waldstein Co's Exhibit at National Metal Exposition

Lacquers and synthetic enamels used on defense materials were exhibited by Maas & Waldstein Co., makers of industrial finishes, Newark, N. J., at the National Metal Exposition in Philadelphia, October 20 to 24. Finishes to take the place of those using aluminum powder and other products that have been affected by the National Defense program were also featured.

Products, such as defense material, air-conditioning units, radios, water coolers, and oil burners exemplified methods of producing various finishing results and of adapting finishing problems to production schedules. Included in the exhibit were quick-drying and baking finishes of great durability and protective qualities and all types of finishes that can be effectively baked by the new infra-red radiation process.

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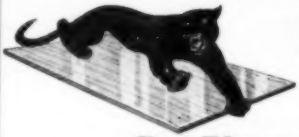

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Frolics in the Finishing Room—6

THIS happened back in the days of hand brushes and varnish, when it was regular practice for the varnish man to apply varnish with a stomper (round brush) and then "lay it off" smoothly with a 2½-in. Clinton fitch varnish brush. While using one brush he would hold the other brush and his quart-size pail of varnish in the other hand. Occasionally, he would have to leave his work for a few minutes. At such times he would usually leave the pail of varnish and his brushes on his work bench.

During the varnisher's absence sometimes a fellow who enjoyed playing jokes on people would slip over to the varnish pail and apply a heavy coat of varnish to the under sides of the paint brush handles. Then, when the varnisher returned and picked up his brushes to resume his work, his hands would stick to the brush handles. It was provoking to say the least, especially to an old skilled craftsman intent upon doing fine work. He would have to wash both of his hands and both brush handles in solvent to remove the sticky mess.

It resulted in lost time and often a showing of angry temper while the prankster had fun laughing and telling about it later.

But one time it wasn't so funny. The culprite was caught in the act. He had a fight with the boss and promptly lost his job—F. W. WORTH.

Flock Finishing

FLOCK finishing is the modern way of finishing various articles with rayon, cotton and wool to give the surfaces a felt or suede appearance.

Some of the articles that are finished in this manner include turntables on radio phonograph combinations, ladies' hand bags, and the more popular usage in commercial advertising display work, as outlined here.

Not having much experience or need for the application of flock on metals, we have applied it on wood of the very softest kind, such as white pine, California red cedar and various plywoods. First, the wood has to be coated with a good synthetic oil undercoater. After drying overnight, the surfaces are "spackled." By this we mean filling up any holes or crevices with a Swedish putty. Then the wood is sandpapered to produce a smooth surface. It is given a mist coat of silk-screen process gloss enamel. This paint is not used as in screen process work but is thinned for spraying purposes.

After leaving the mist coat set for 20 to 30 minutes, we follow with a wet coat of the same enamel, making sure in this last application of paint that the article is evenly coated, so that when the flock is applied it will adhere to the enamel uniformly.

The article is now ready to receive the flock. Before this opera-

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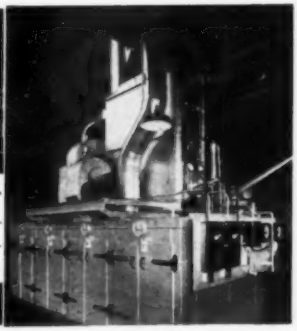


tion is started the flock gun should be put in readiness. That is, the container should be filled only three-quarters full with flock and all adjustments should be made so that too much flock does not escape through the nose of the gun. The reason the container on the gun should only be filled three-quarters full is that the air coming through into the container must have a space in which to blow the flock around to scatter the particles. This is very important.

The air pressure for flocking should be between 40 and 60-lbs.—never more nor less. The air lines should be kept filtered to prevent oil and water accumulations. We found that the best method is to coat the edges with flock and then spray the top surface.

It is best to let the flocked surface dry overnight, or, if the facilities of a baking oven are available, it can be baked dry at a temperature of 120°F. *It is best, when anything is to be flocked, that the color of the paint match closely to the color of the flock.* When the article is well dried the excess flock is then dumped off on paper so we can reclaim that which did not adhere to the surfaces being flocked.

Although flock may also be applied by the agitation or sifting method, we have found that in our particular line the spray gun method is more practical. — JOHN F. WAGNER.

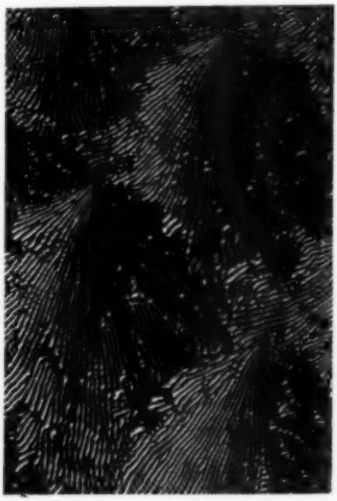
Pine Tree Finish

AN attractive pine-tree finish in metallic colors can be produced economically with a one-coat baked wrinkle varnish or enamel (in clear or any color) plus an overall spraying of air-dry metallic finish. The complete finish, one pattern of which is shown in the accompanying illustration, is especially adapted to the exteriors of metal caskets.

A very good wrinkle varnish or enamel of the baking type is sprayed on the dry clean metal surface, using an air pressure of 65 to 70-lbs. at the gun. The material is sprayed on heavy enough to produce sags.

Immediately after the material is sprayed, the metal panels are placed in almost vertical position and "marked" with a sharp pointed pencil to guide the flow-down of sags into a symetrical or orderly arrangement, if such is desired, to produce the pine tree or mountain peak effect. As soon as the marking is completed, the panels are placed in an oven for a bake of 225° to 250° F. for 1½ to two hours.

When the baking of the wrinkle



Pine tree pattern of wrinkle finish.

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coat is completed the surfaces are ready for the bronze powder finish, or any metallic or color coating desired. This can be a short-bake or an air-drying material. I suggest using a bronzing vehicle that will take 1½ to 2-lbs. of bronze to a gallon of liquid.

An important step in this procedure is to mix the bronze and vehicle just before starting the job of spraying. To let this mixture stand already mixed in containers will cause a loss of gloss and it may result in a very hard settling, which is typical of bronze powders. A good plan is to figure as closely as possible the amount of material to be used in one day on one job. This procedure, if followed, will not only save trouble, but also give satisfactory production results. — JOSEPH TOKARZ.

Machinery Finishes (Synthetics Favored)

MACHINERY finishes must resist many conditions that cause paints and enamels to deteriorate, according to paint technicians. Contact with oil, grease, and other solvents; temperature variations from cold to intense heat, and abrasion tend to shorten the life of finishes. In certain industries frequent spillage and constant hosing down cause failure of the paint film.

New synthetic resin-base machinery finishes possess greater durability than oil or varnish-type enamels. They are relatively unaffected by contact with petroleum oils or grease, and highly volatile thinners affect them but slightly. Dark-colored machinery finishes of this type retain their life and good looks despite intense heat. The flexibility of the finish renders it resistant to knocks and minimizes cracking or chipping.

Synthetic-resin enamels are found by the bottling and dairy industries to stand up and keep their color in spite of spillage of a variety of liquids. They also withstand daily "hosing down" and give excellent service under the most sanitary routine.

Grease, oil, rust or deposits of any kind should be removed before applying any machinery finish. Surfaces must be washed with turpentine, and the finish brushed or sprayed on. One or more coats, depending on the quality of finish desired and the system employed, are required.—DuPont Co.

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Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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Published the 15th of each month by PRACTICAL PUBLICATIONS, Inc.
1142 N. Meridian St., Indianapolis, Ind.
Telephone.....Riley 6771

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President.....A. T. Gaumer
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Subscription Rates per Year
U. S. and Possessions.....$2.00
Canada and Foreign Countries.....$3.00
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Editorial

Furniture Style Trends Materials, Finishes, Colors

Style trends have always been connected with news of the hour, and the fact that a war is raging on several continents has done much and will do more to affect design in home furnishings. In the last six months priority shortages have forced furniture designers to use all of their ingenuity in finding substitutes for materials that have been cornered by the defense program. Plastics came into play but now, with a shortage of formaldehyde which is a primary requisite in the manufacture of plastics, new materials are expected to be found available for use in manufacturing furniture.

The public, too, has a great part to play in effecting style changes, and the fact that the defense program has put money into the pockets of the average consumer makes a difference in the styling of furniture.

There has been a definite trend, which will grow steadily, toward more elaborate design on occasional pieces and accessories. French, simplified to some degree, will be used in lamp tables, cocktail tables and occasional chairs. New finishes in lacquers will play a great part in this trend. In fact, painted furniture is reappearing — not the painted furniture of twenty years ago — but a new type featuring highly styled artistry which will develop a finished look and introduce a luxury note. Lamps will plunge into this new era with a flourish, because here is a field where the designer can use elaborate ideas without becoming "borax."

Baroque continues to be a highlight of the trend. Mirrors, lamps, pictures — all of them will be touched by curves, scrolls and overemphasized brilliance. But, beneath this swing toward ornamentation is a strong current of modern which will steady and balance period design.

Several months ago the South American influence was felt in furniture design. Now the Chinese influence, especially in modern, will be shown. There are rumors that a new note in modern will be introduced—Hawaiian—and style au-

thorities will be looking for evidence of this at the coming market. This rumor springs from vacationing designers who have taken in the beauty of the islands and wish to show a feeling of the exotic lushness of the tropics in their creations. Perhaps fabrics will be the keynote with new woods, finishes and line carrying out the theme. The possibilities are apparent.

The sweeping popularity of Federal American, due to our own nationalistic feeling because of conditions abroad, is expected to continue. The Federal theme has been carried out in all types of accessories. Wall sconces, lamps, even carpeting are going heavily patriotic and the American eagle will be seen on all types of home furnishings. Many believe that this trend will continue even after we settle back to our normal routine, as the purely classical lines of Federal design are excellent and the style is worthy of its place in the sun.

It is predicted that shortages in materials may produce some drastic changes in furniture manufacture and styles may be cut down so that only the "big sellers" will remain in many lines. Some of the things anticipated during the coming market are as follows:

Synthetic materials, to take the place of wool and silk, may be used on upholstered pieces.

Fringe and frivolous trim will be apparent on lamp shades.

Color will be a new note. Shades of one predominating color will be blended in patterns on upholstered pieces. Painted kitchen furniture will stress individuality and monograms will be used on tables and chairs. Lighter tones such as gray and shades of rose, blue and green will become more popular.

The majority of manufacturers seem to be well supplied with materials needed for finishing their merchandise. However, there is always a possibility of reverting back to varnish if lacquers and synthetic materials are not available. Here is another field that may show the effect of invention and something entirely new may be developed. — AMERICAN FURNITURE MART.

To Get More Out of Men, Money and Materials

In times like these, when industry is confronted with emergency production demands, the need for more effective accident controls in order to conserve men, money and materials becomes of paramount importance. Plant expansion, development of new processes, maintenance of heavily worked equipment, employment of new workers and other similar problems call for more than usual ingenuity and skill on the part of management, if a "job" is to be done not only well but safely.

These vital considerations are emphasized in a new report issued by the Industrial Safety Section of the Metropolitan Life Insurance Company. The report is entitled, "Conserving Men, Money, and Materials in Essential Industries." It is basically a discussion check list for the industrial executive concerned with emergency production.

The report lays particular stress on the proper consideration of accident costs. Of far greater significance than the threat of personal-injury accidents are the enormous potential losses of precious time and the spoilage of equally precious materials that result from mishaps sometimes termed "near accidents"

—indirect losses which are generally overlooked in compiling accident reports or statistics, yet which to the production executive represent very real items of industrial waste.

As an aid to the study of industrial accidents and to point up proper means for their control, the report briefly develops several fundamental considerations for employe safety.

Copies of this report are available to executives who address the Bureau on their business stationery. Address: Policyholders Service Bureau, Metropolitan Life Insurance Co., One Madison Ave., New York, N. Y.

Finishing Material Scarcity; What You Can Get Now

Here are a few timely offhand comments from one of our friends who is with a manufacturer of finishing materials.—Editor.

* The time has arrived that no manufacturer of furniture ever dreamed of. None of them thought, six months ago, that they would be told by salesmen that the finish manufacturers would not be able to supply them with lacquer sealer, and flat and gloss lacquers. However, the time is here and every one is going to have to make the best of conditions as they are.

The paint manufacturer is trying in all ways he can to supply his customers with lacquers, but he cannot promise them how long or when deliveries can be made. Some furniture manufacturers were farsighted enough to place orders far enough ahead to last them until the first of the year, paying in advance for same; so their names were placed on the drums marked property of so and so, and stored at the plant of the paint manufacturer.

We hope that by the first of the year things will change, but it is very doubtful. It is advisable for those who intend to continue operations to start changing over now to enamels, varnishes and varnish sealers. Some of our customers have started the change, as we are making a varnish sealer that dries to sand in 15 minutes. Those who have conveyor ovens or other force-drying equipment should not have much trouble keeping up production.

Synthetics are out of the question and shellac will probably be too high, and no alcohol to cut it with. Cold-cut varnishes are plentiful, as well as many others. Oil stains will be plentiful, but aniline stains will go sky high. Oxide colors are getting scarce; some you cannot buy at all. We have been forced to turn down new accounts for lacquers and some stains. We intend to take care of those who have been steady customers.

These are the facts for the coming year, and unless Uncle Sam opens up it is hard to tell what will come next. We do hope that paint manufacturers will be able to keep their men at their jobs. One dislikes to see trained men leave after having been with the firm several years, for after it is all over those same men may not come back. As a rule, men in the paint industries are well paid and would not be able to make the same wages on defense jobs.—RUSSELL DAVIS.

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* Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

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Today's Finishing Salesmen Solve Your Problems

★ Having been connected, in one way or another, with the finishing business for the last 20 years, I have had an opportunity to observe the gradual evolution in the type of salesmen calling on manufacturers—that is calling on concerns that use a widely diversified line of finishing materials on a variety of products.

It is not my intention to cast any reflection on the so-called "old timers" of the industry. They are a fine group of fellows who have done an excellent job, considering the fact that the majority of them knew little or nothing about the products they were selling, other than price. Many of them knew very little about the specific needs of each individuel manufacturer, whose product generally required a material a little different from the material used by his neighbor or competitor.

This type of salesman, whose chief stock in trade was a pocket full of cigars, a slap on the back for everyone, an inexhaustible supply of stories, and high-pressure tactics, is gradually being replaced, in most finishing supply houses, with practical or technical men whose training and background are an asset to their company, as well as to the trade in general.

The practical man is usually one who has been a foreman finisher. By learning his trade thoroughly and being aggressive he has graduated to a service man and has eventually become a salesman. His job takes him into all kinds of plants, manufacturing many different products. This type of man is quick to grasp and store away information on various methods and procedure. The contacts he makes tend to round out his "rough edges" and, in general, the information he acquires makes him a veritable storehouse of knowledge.

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usually he can work out new colors and color harmony, give accurate labor and material costs, and line up production facilities to conform with the finishing schedules on these new lines.

Now we come to the technical men who have formulated and supervised the manufacture of materials and are now traveling territories. They are a blessing to the industry. They can, on the spot, write specifications for materials to any given job. They can advise you the best methods of obtaining a finish on metal, wood or what have you, that will add beauty and durability to the product—for either an air-dry, accelerated or force-dry schedule.

Lucky is the manufacturer on whom either of these types of salesmen call—and luckier still, is the manufacturer who is visited by a composite of both types of these men. If it were possible to sum up the amount of money these salesmen save manufacturers each year, the figures would be astounding, I am sure.—JOE WILBOURN (Technical Service).

Adhesion of a Finish Coat to The Surface it Covers

★ The prime requisite of an organic finish is that it adhere to the surface to which it is applied. Not only must it exhibit good original adhesion, but it must continue to adhere to the surface when subjected to field conditions such as moisture, etc.—preferably for the useful life of the object it covers. If a finish does not fulfill this requirement, its protective and decorative value is lost and it becomes worthless. It is apparent, therefore, that the first and most important test in the evalua-

tion of an organic finish is the adhesion test.

Adhesion is defined generally as the adherence or sticking together of substances in contact with each other. In the case of organic finishes, adhesion is the bond between the finish film and the surface to which it is applied. This bond is a function of two forces, namely mechanical adhesion and the specific adhesion.

Mechanical adhesion may be described as a purely mechanical keying of the film into the surface. It is dependent principally on the roughness (and in the case of wood, the porosity) of the surface.

Specific adhesion is that attraction at the interface between the finish film and the surface of the body to which it is applied. It is not a mechanical phenomenon, but rather an electrical one due to the degree of attraction at the interface of the molecules of the finish film and the body. A good but not perfect analogy would be that a finish adheres to sandpaper by mechanical adhesion, but to glass or chromium by specific adhesion.

Unfortunately, there is no absolutely quantitative method of exactly determining mechanical and specific adhesion. No doubt there will be in the future, but now the old methods of bending tests, impact tests, etc., must be used in the old way to determine if the adhesion of a finish is acceptable for use on a product. However, do not forget that adhesion is the result of a number of forces. Because we cannot measure them does not infer that they do not exist. Use the old test methods, but beware of the complexity of what we call adhesion, and your judgments of finishing materials will be the better for it. — WILLARD SEEMAN.

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Ask the Man Who Knows

* Old-timers will remember the story about Mr. Henry Ford and the executives. The story goes that Mr. Ford, walking through one of his manufacturing sections with a group of important visiting executives, stepped aside to talk with a machinist. The conversation lasted quite some time—so long in fact, that one of the men waiting was considerably nettled. When Mr. Ford returned to the group, the impatient gentleman asked somewhat testily if the conversation had proved interesting.

Mr. Ford is reputed as having replied, "Yes, it was interesting. That machinist knows more about his job than I do about mine, and," looking the annoyed executive straight in the eye, "probably more than you know about yours."

He then addressed the group as a whole. "Gentlemen," he said, "I have nothing but respect for the knowledge of a man who has worked with a job and knows it thoroughly. Too often, in making our decisions, we are prone to forget the importance of his opinions. It might be well if we spent more time in the plant and less time in the office."

The moral of this story is perfectly obvious. In terms of finishing, it is always a good idea to consult the man who uses the spray gun, who rubs and sands the finish. Remember always that in the final analysis the man who really knows some facts is the man who works day in and day out in the factory. —FRANK J. MANNING.

Antique Finish on Furniture

THIS MAY seem just a mere trifle to some finishers, but to produce a real antique finish for any kind of furniture, the proper base color is the outstandng factor in producing the right results. After this has been worked out, the next step is to get the proper glazing color—preferably a warm color —that will add distinction to the color. It must be blended out, first with a soft cloth and then with a soft brush, wiping certain areas out to show worn places.

An antique finish is nothing more than the duplication of worn finished surfaces, along with the accumulation of dirt that is picked up in service. A good example of this can be studied by going into a barber shop or a hotel or club where pieces of furniture, such as golden oak or similar pieces have been used for some years. You can readily see where to place the antiqued areas and thereby produce

an exact duplication of antiqued work.

Any worker who hasn't the proper touch and skill to produce these results, should not attempt a job of this kind, as it only throws a poor class of work onto the market. At the same time it spoils the distinction of what antique finishing should be.

Apply a coat of sealer over the glaze when it is dry; then sand smoothly and apply a coat of flat (egg-shell gloss) lacquer. Rub and wax to complete the job.—F. W. WORTH.

Chase Drier & Chemical Co. Moves to Cleveland

The Chase Drier & Chemical Co. announces the removal of its offices from 3505 Smallman St., Pittsburgh, Penna., to 4150 E. 56th St., Cleveland, Ohio. All correspondence, inquiries, orders, etc. should be directed to the new address.

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The Brown Instrument Co., Wayne & Roberts Avenues, Philadelphia, Penna., has just issued catalog No. 2204, which contains 16 pages of valuable information about the Brown mechanical flow and liquid meters for indicating, recording and controling. The catalog has several illustrated descriptions of the instruments and their operating parts.

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Index to Advertisers

Advance Paint Co. ..... Third Cover
American Air Filter Co. 1
American Richwood Products Co. 62

Berry Brothers 49
Binks Mfg. Co. 40-41

Campbell Co., M. L. 81
Chicago Eye Shield Co. 74
Classified Advertising 83
Claremont Waste Mfg. Co. 7
Clinton Co., The 31
Crown Spray Gun Mfg. Co. 61

Day & Co., James B. 51
Despatch Oven Co. 68
Detroit Surfacing Machine Co. ..... Front Cover
DeVilbiss Co., The 34-35
Dolan & Company, V. J. 5
du Pont deNemours & Co., E. I. 44-45
Duralac Chemical Co. 8

Eclipse Air Brush Co. 62
Egyptian Lacquer Mfg. Co. 59

Ferro Enamel Corp. 25

Glidden Co., The 28
Graining Roller Co. 82

Hilo Varnish Corp. 75

Industrial Chemical Development Corp. 69
Industrial Sheet Metal Works 9
Industrial Tape Corp. 23

Koch Sons, Inc., George 71

Lilly Varnish Co. 10-11

M. & E. Mfg. Co. 83
Maas and Waldstein Co. 57
Mahon Co., The R. C. 33
Martin Varnish Co. 66
Minnesota Mining & Mfg. Co. 53
Mixing Equipment Co. 65

Naz-Dar Co. 79

Pittsburgh Plate Glass Co. 26-27
Pulmosan Safety Equipment Corp. 66

Randolph Finishing Products Co. 61
Rayon Processing Co. 79
Reliance Varnish Co. 36
Rockford Varnish Co. 55
Roxalin Flexible Lacquer Co. ..... Second Cover
Rudd Lacquer Corp. 43

Schaefer Varnish Co. 70
Southern Varnish Corp. ..... Back Cover

United Lacquer Mfg. Corp. 6

van Allen Company, L. R. 82
Varnish Products Co. 63

Walker Co. H. V. 73

Zapon Division—Atlas Powder Co. 2

"The article in your September issue (pages 24-25) describing our finishing by means of infra-drying, has been carefully noted, and we want to compliment you and Mr. Slawson on its intelligent and interesting presentation.

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—H. B. Meyer, President, Meyer Mfg. Co., Chicago, Ill.

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